



410005

SCREENING SITE INSPECTION REPORT
FOR
PALM INDUSTRIES
LITCHFIELD, MINNESOTA
U.S. EPA ID: MNDO44176394
SS ID: NONE
TDD: F05-8707-016
PAN: FMN0116SA

OCTOBER 31, 1991



ecology and environment, inc.

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1. INTRODUCTION

Ecology and Environment, Inc., Field Investigation Team (FIT) was tasked by the United States Environmental Protection Agency (U.S. EPA) to conduct a screening site inspection (SSI) of the Palm Industries site under contract number 68-01-7347.

The site was initially discovered by the Minnesota Pollution Control Agency (MPCA) in 1983. The site was discovered through a complaint filed with the MPCA alleging that paint material and solids were being burned and buried behind a building on-site (MPCA Complaint Report 1983).

The site was evaluated in the form of a preliminary assessment (PA) that was submitted to U.S. EPA. The PA was prepared by Susan M. Cedarleaf of the MPCA. The PA is dated August 26, 1985.

FIT prepared an SSI work plan for the Palm Industries site under technical directive document (TDD) F05-8702-060 issued on February 2, 1987. The SSI work plan was approved by U.S. EPA on July 6, 1987. The SSI of the Palm Industries site was conducted on October 21 and 22, 1987 under TDD F05-8707-016 issued on July 6, 1987.

The FIT SSI included an interview with a site representative, a reconnaissance inspection of the site, and the collection of seven soil samples, two residential well samples, and two municipal well samples.

The purposes of an SSI have been stated by U.S. EPA in a directive outlining Pre-Remedial Program strategies. The directive states:

All sites will receive a screening SI to 1) collect additional data beyond the PA to enable a more refined preliminary HRS [Hazard Ranking System] score, 2) establish priorities among sites most likely to qualify for the NPL [National Priorities List], and 3) identify the most critical data requirements for the listing SI step. A screening SI will not have rigorous data quality objectives (DQOs). Based on the refined preliminary HRS score and other technical judgement factors, the site will then either be designated as NFRAP [no further remedial action planned], or carried forward as an NPL listing candidate. A listing SI will not automatically be done on these sites, however. First, they will go through a management evaluation to determine whether they can be addressed by another authority such as RCRA [Resource Conservation and Recovery Act].... Sites that are designated NFRAP or deferred to other statutes are not candidates for a listing SI.

The listing SI will address all the data requirements of the revised HRS using field screening and NPL level DQOs. It may also provide needed data in a format to support remedial investigation work plan development. Only sites that appear to score high enough for listing and that have not been deferred to another authority will receive a listing SI (U.S. EPA 1988).

U.S. EPA Region V has also instructed FIT to identify sites during the SSI that may require removal action to remediate an immediate human health and/or environmental threat.

2. SITE BACKGROUND

2.1 INTRODUCTION

This section includes information obtained from SSI work plan preparation and the site representative interview.

2.2 SITE DESCRIPTION

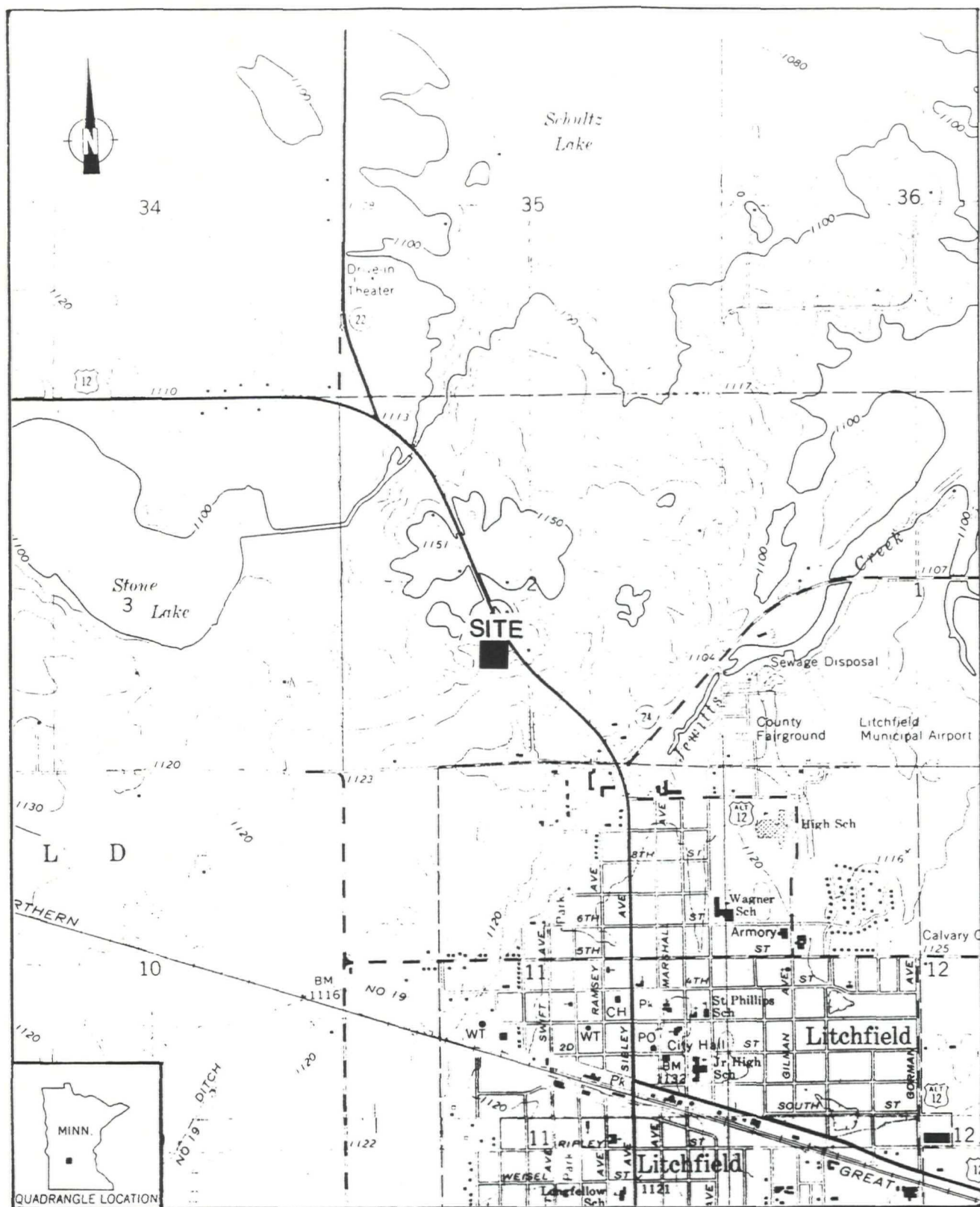
On the Palm Industries site is a plant that actively manufactures tractor cabs and roll bars and fabricates steel specialties. Paint waste, thinner, crankcase oil, and solid wastes have been buried and burned behind the plant on-site (MPCA 1985).

The site is located on approximately 10 acres of land in the SW1/4 of sec. 2, T.119N., R.31W. of Meeker County, Minnesota, on West Highway 12, approximately 1/2 mile north of the town of Litchfield (see Figure 2-1).

The area surrounding the site is primarily rural with farmland located in the vicinity of the site. The economy of the town of Litchfield is based primarily on small businesses and some light industry. A 4-mile radius map of the Palm Industries site is provided in Appendix A.

2.3 SITE HISTORY

The site property is currently owned by a parent company of Palm Industries Inc. called Loram, located on Highway 55 in Hamel, Minnesota. Loram acquired the company from the Rauenhurst Company of Minneapolis in 1978. The original owner was Mr. Harlen Palm, who now resides in Grove City, Minnesota. Palm Industries burned and buried paint, thinner,



SOURCE: Ecology and Environment, Inc., 1988; BASE MAP: USGS, Litchfield North, MN Quadrangle, 7.5 Minute Series, 1967.

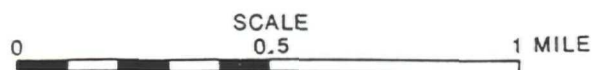


FIGURE 2-1 SITE LOCATION

crankcase oil, and solid waste on-site behind its building from 1970 to 1983, ceasing these practices in 1983 after being told to discontinue them by the MPCA (MPCA office memorandum 1983).

In March 1983, the MPCA received a complaint (source unknown) regarding paint thinners being dumped into a hole in back of the building at the Palm Industries site. As a result of the complaint, the facility was inspected by Region IV of the MPCA. The inspection revealed that the quantity of hazardous waste being stored in drums on-site was in excess of the total quantity indicated as being generated on-site annually on a disclosure submitted to the MPCA by Palm Industries (MPCA office memorandum 1983). As a result, the Palm Industries facility was identified as being a technical storage facility by the MPCA (Mader 1983). The MPCA then requested that Palm Industries submit an updated disclosure and an EPA notification form and also implement actions regarding the appropriate handling and storage of hazardous wastes. In January 1984, Palm Industries submitted a new hazardous waste disclosure and hazardous waste management plan for the crankcase oil, thinner, and paint wastes being generated on-site (Palm Industries, Inc. 1984).

In May 1984, the MPCA performed another site inspection at Palm Industries and cited the following violations:

- Insecure covers on drums;
- Failure to provide outside storage area for liquid hazardous waste with a curbed, impermeable surface and appropriate security;
- Flammable hazardous waste was not stored at least 50 feet from the property line and was not shaded from direct sunlight;
- Exceeding the small quantity generators' accumulation limit of 1,000 kilograms or the equivalent;

- Incorrectly labeled containers of hazardous waste;
- No log of weekly inspections where hazardous waste is stored;
- Failure to evaluate all wastes to determine whether they are hazardous;
- Failure to submit an annual report; and
- Burning and dumping of wastes on-site.

A formal "notice of violation" was issued to Palm Industries by MPCA in December 1985, which cited the following generator requirement violations (MPCA 1985):

- Failure to train appropriate personnel in hazardous waste management procedures;
- Failure to make arrangements with local authorities for emergencies;
- Failure to have a contingency plan; and
- Failure to submit an annual report.

In June 1986, MPCA approved Palm Industries' management plans for paint waste, paint thinner, and crankcase oil (Wegart 1986).

An electromagnetic exploration of the site was conducted in October of 1986 by MPCA in an attempt to determine the existence of a possible contamination plume (MPCA 1986). The result of this study, however, was inconclusive.

3. SCREENING SITE INSPECTION PROCEDURES AND FIELD OBSERVATIONS

3.1 INTRODUCTION

This section outlines procedures and observations of the SSI of the Palm Industries site. Individual subsections address the site representative interview, reconnaissance inspection, and sampling procedures. Rationales for specific FIT activities are also provided. The SSI was conducted in accordance with the U.S.EPA-approved work plan.

The U.S. EPA Potential Hazardous Waste Site Inspection Report (Form 2070-13) for the Palm Industries site is provided in Appendix B.

3.2 SITE REPRESENTATIVE INTERVIEW

Matthew Arnold, FIT team leader, conducted an interview with Gary Stone, plant manager of Palm Industries. Stone had been designated a representative of Palm Industries. The interview was conducted on May 13, 1988, by telephone at 9:00 a.m. The interview was conducted on this date because of the unavailability of Mr. Stone on the date of the site inspection. The interview was conducted to gather information that would aid FIT in conducting SSI activities.

3.3 RECONNAISSANCE INSPECTION

FIT conducted a reconnaissance inspection of the Palm Industries site and surrounding area in accordance with FIT Health and Safety guidelines. The reconnaissance inspection included a walk-through of the site to determine appropriate health and safety requirements for conducting on-site activities and to make observations to aid in

characterizing the site. FIT also determined exact sampling locations during the reconnaissance inspection.

The reconnaissance inspection began on October 21, 1987, at 9:00 a.m.

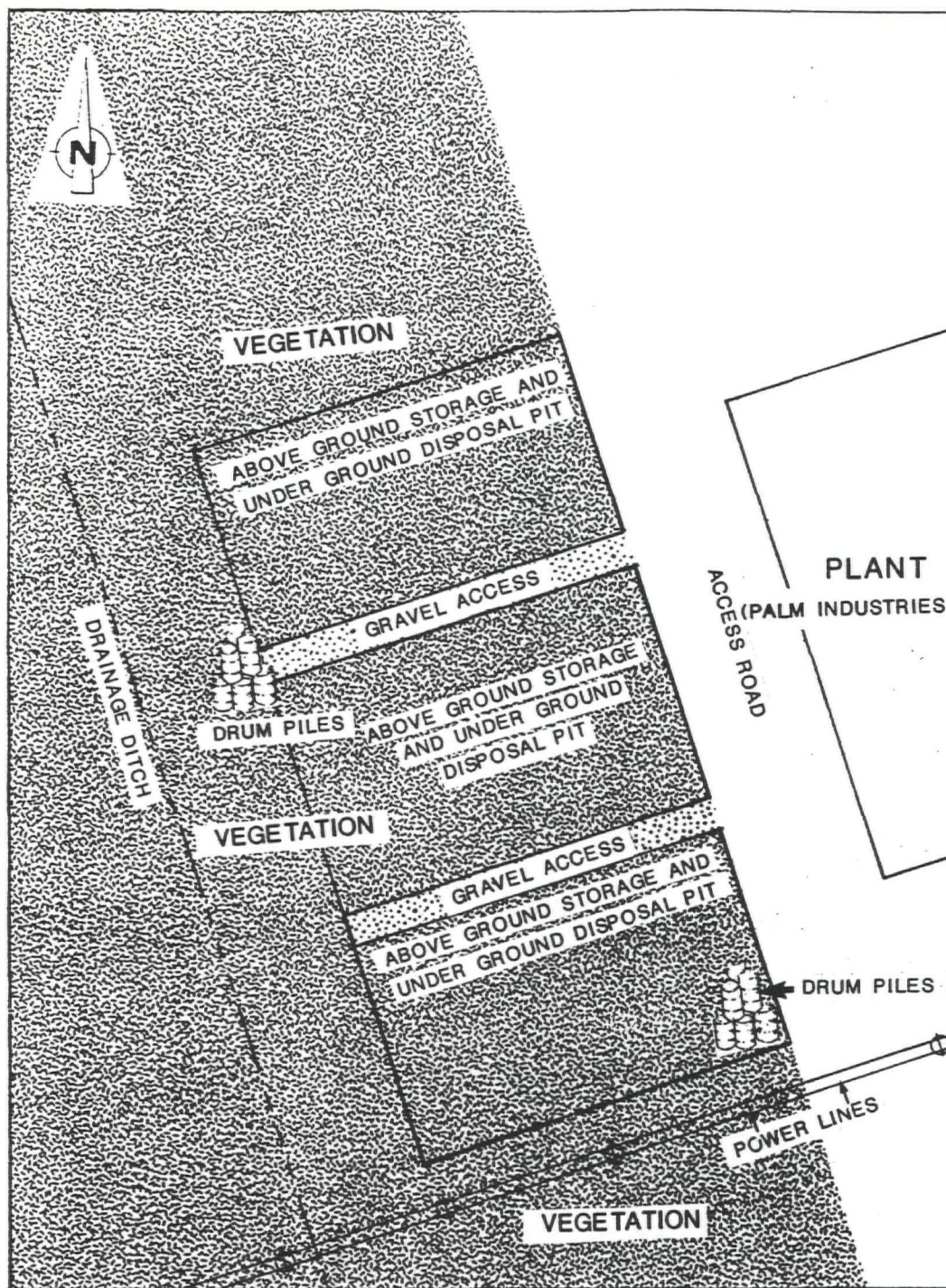
Reconnaissance Inspection Observations. The Palm Industries disposal area is located behind the Palm Industries plant on the site. The site is bordered on the south by a church property that is within 500 feet of the site. The western perimeter of the site slopes moderately downward to adjacent farmland. A drainage ditch that runs north-south behind the disposal area along the western perimeter of the site was observed to be dry at the time of the site inspection (see Figure 3-1 for location of site features). FIT observed a hardened plastic-type material on the surface of the soil in the drainage ditch. This material was sampled by FIT.

The site is bordered to the north by a residence and farm and to the east by West Highway 12. Across the highway to the east are two mobile home parks. The perimeter of the site property is not fenced. There is no security guard or other means of security utilized at the site.

The on-site disposal area is approximately 100 yards long and 50 yards wide and is cluttered with old tractor cab frames, scrap metal, and approximately 30 deteriorated 55-gallon drums. The metal is stored in rows running from east to west with access paths lying between the rows. The drums are stored in piles that are scattered about the disposal area. Some drums are partially full, punctured, or not sealed and leaking. Waste that had the appearance of dried paint or resin was observed directly on the soil surface. Vegetation on-site consists mostly of wild grasses and herbaceous plants, which appeared to be stressed in some areas. Photographs of the Palm Industries site are provided in Appendix C.

3.4 SAMPLING PROCEDURES

Samples were collected by FIT at locations determined during the reconnaissance inspection to determine levels of U.S. EPA Target Compound List (TCL) compounds and U.S. EPA Target Analyte List (TAL)



SOURCE: Ecology and Environment, Inc., 1988.

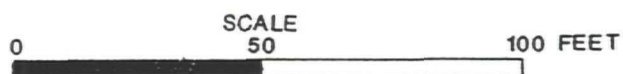


FIGURE 3-1 SITE FEATURES

analytes present at the site. The TCL and TAL are provided in Appendix E.

On October 21, 1987, FIT collected six on-site soil samples and one off-site potential background soil sample. On October 22, 1987, FIT collected two municipal well samples and two residential well samples. Portions of samples were offered to the site representative, but were declined.

Soil Sampling Procedures. Samples S1, S2, and S3 were collected at the soil surface on the western edge of the site at the base of a pile of approximately 15 deteriorated 55-gallon drums (see Figure 3-2 for on-site soil sampling locations). These sampling locations were chosen because of the presence of stains on the soil surface. A garden trowel was used to collect the surface samples, which were then transferred to a stainless steel bowl. The samples were then individually mixed. After rocks and organic material were removed, each sample was transferred to sample bottles using stainless steel spoons (E & E 1987).

Samples S4, S5, and S6 were subsurface soil samples collected from the on-site disposal area. Sample locations were chosen based on the approximate location of trenches where hazardous waste was buried and burned (Stone 1988). Sample S4 was collected from a point near the center of the disposal area. Samples S5 and S6 were collected near the western edge of the disposal area. Subsurface soil samples were collected using a field technique that utilized a power auger for boring a sample hole to the desired depth and a stainless steel split spoon to extract the soil sample from the bottom of the borehole. The material collected in the split spoon was then transferred to a stainless steel bowl. Sample material was then transferred to sample bottles using stainless steel spoons (E & E 1987). The depths at which subsurface soil samples S4, S5, and S6 were taken, and corresponding photo-ionization detector (PID) readings for the sample material removed from the holes are given in Table 3-1.

A potential background soil sample (indicated as S7) was collected in a lightly wooded area, approximately 1/4 mile southeast of the site

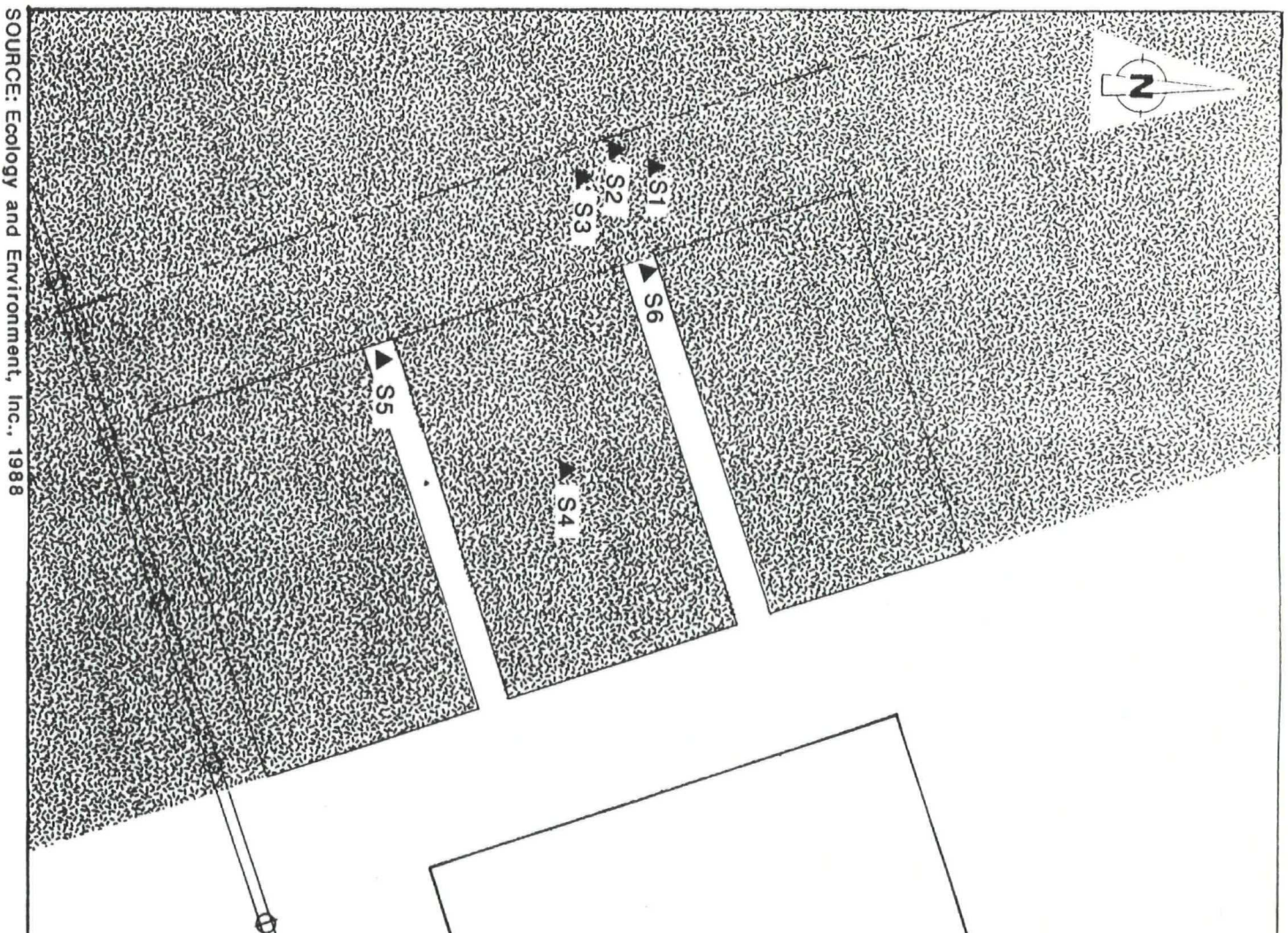


FIGURE 3-2 ON-SITE SOIL SAMPLING LOCATIONS

Table 3-1
SUBSURFACE SOIL SAMPLE DEPTHS AND PID READINGS

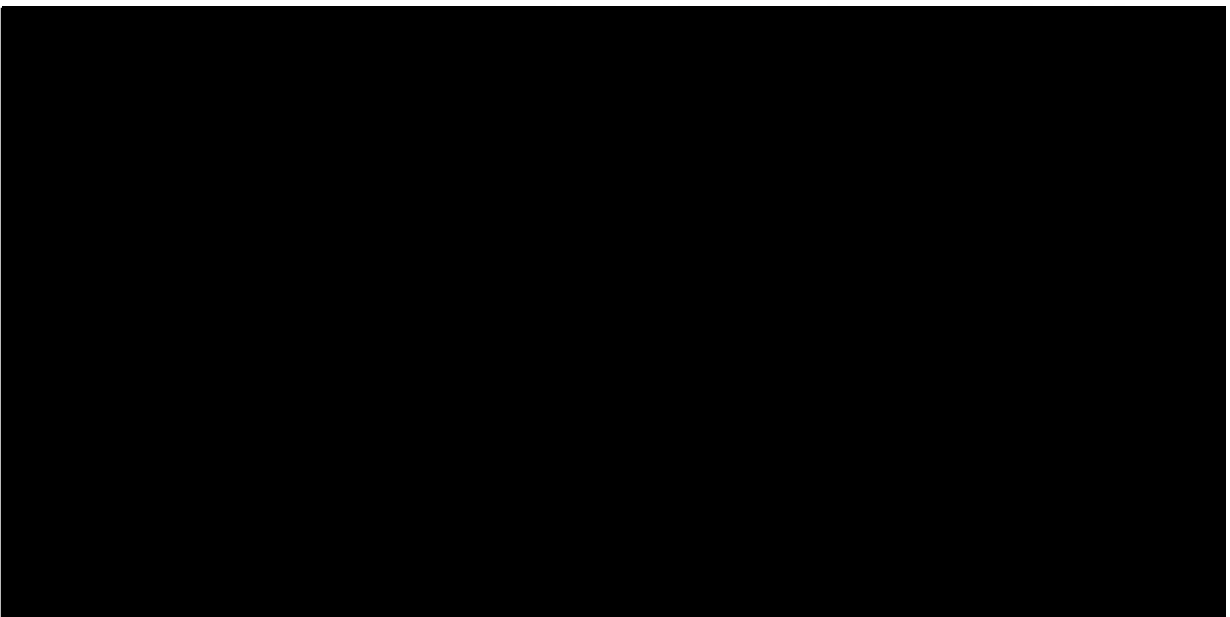
SAMPLE DESIGNATION	DEPTH (feet)	PID READINGS (ppm Benzene Equivalent)
S4	4 1/2 to 5	50
S5	5 1/2 to 6	30 \geq 50
S6	7 1/2 to 8	30 \geq 50

Source: Ecology and Environment, Inc. 1988.

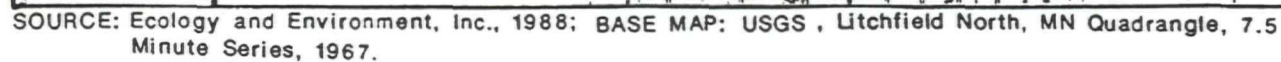
(see Figure 3-3 for off-site soil sampling location). The potential background soil sample was collected to determine the representative chemical content of the soil in the area surrounding the site. The location was chosen because the ground surface appeared to be in an undisturbed state. Soil sample S7 was obtained by using a trowel to dig to an approximate depth of an approximate depth of 3 inches. Soil was then transferred to a stainless steel bowl with the trowel. After debris had been removed from the soil, the soil was then transferred to sample bottles using a stainless steel spoon (E & E 1987).

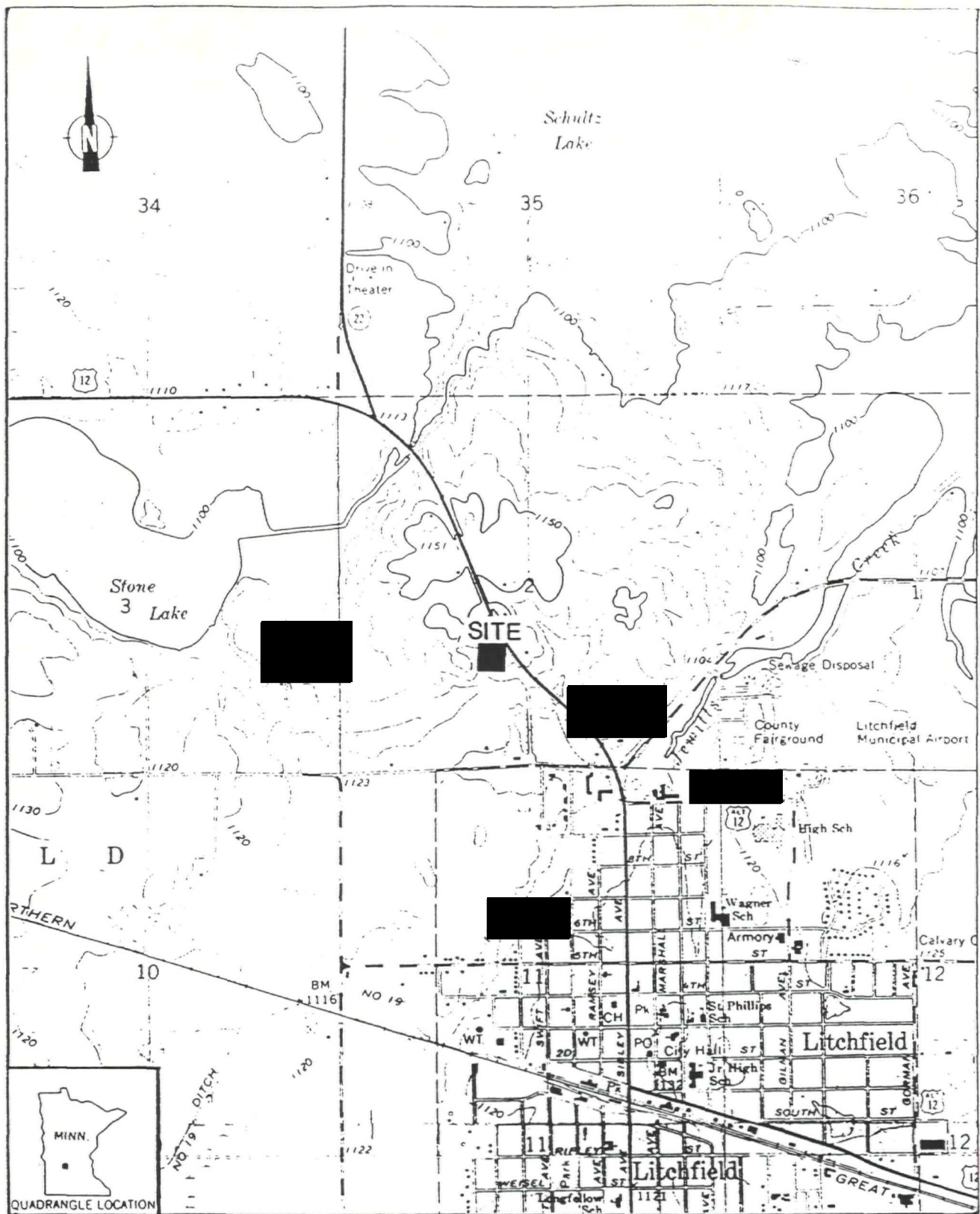
Standard E & E decontamination procedures were adhered to during the collection of all soil samples. The procedures included the scrubbing of all equipment (e.g., auger flights, trowels, bowls, split spoons, and spoons) with a solution of detergent and water, and triple rinsing the equipment with distilled water before the collection of each sample (E & E 1987). All soil samples were packaged and shipped in accordance with U.S. EPA-required procedures.

As directed by U.S. EPA, all soil samples were analyzed for TCL compounds by Cenref Labs of Brighton, Colorado, and for TAL analytes by Cambridge Analytical Associates of Boston, Massachusetts.



Sample RW1 was collected at Litchfield municipal well #14, located on North Miller Street in Litchfield, Minnesota, approximately 4,225 feet south of the site (see Figure 3-4 for residential and municipal well sampling locations). Sample RW2 was collected at Litchfield





SOURCE: Ecology and Environment, Inc., 1988; BASE MAP: USGS, Litchfield North, MN Quadrangle, 7.5 Minute Series, 1967.

FIGURE 3-4 RESIDENTIAL AND MUNICIPAL WELL SAMPLING LOCATIONS

municipal well #8, located on East 10th Street in Litchfield, Minnesota, approximately 3,168 feet southeast of the site. Both municipal wells are 150 feet deep (Warmbier 1987). Sample RW3 was collected from a residence approximately 1/2 mile west of the site. Sample RW4 was collected from a government office located approximately 1/4 mile southeast of the site (see Table 3-2 for addresses of residential well sampling locations).

All residential and municipal well samples were obtained from outlets that bypassed water treatment systems and/or storage tanks. The water was allowed to discharge from the outlets for 15 minutes before samples were collected to ensure that the sample sources had been purged of standing water (E & E 1987). All residential and municipal well samples were packaged and shipped in accordance with U.S. EPA-required procedures.

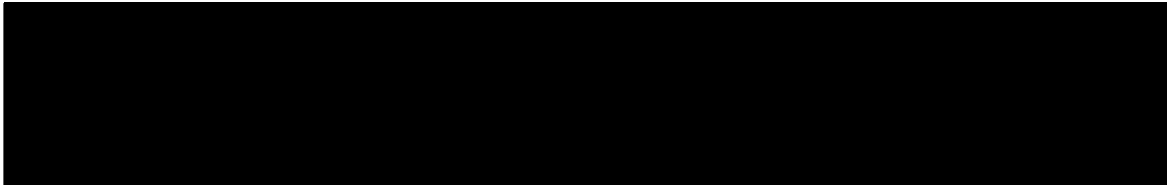


Table 3-2



Sample

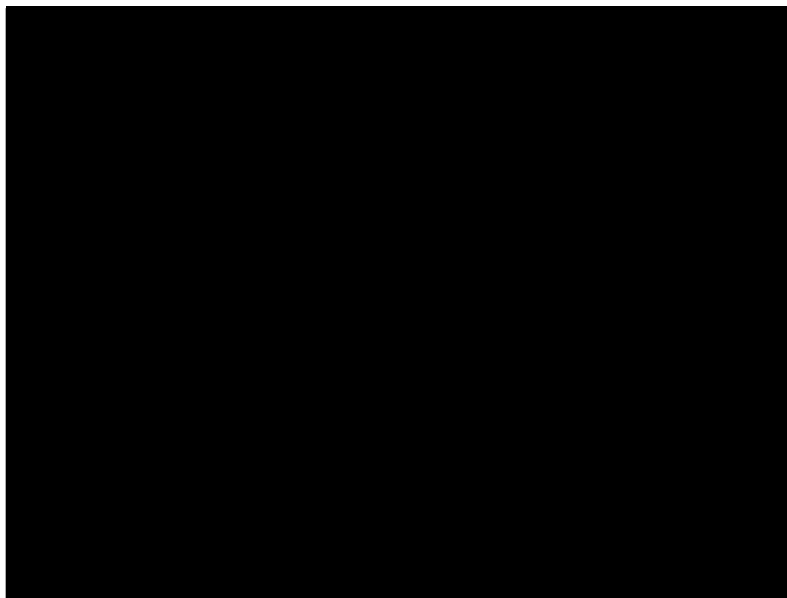
Address

RW1

RW2

RW3

RW4



Source: Ecology and Environment, Inc. 1988.

4. ANALYTICAL RESULTS

4.1 INTRODUCTION

This section includes results of chemical analysis of FIT-collected soil samples and residential and municipal well samples for TCL compounds and TAL analytes.

4.2 RESULTS OF CHEMICAL ANALYSIS OF FIT-COLLECTED SAMPLES

Chemical analysis of FIT-collected soil samples revealed substances from the following groups of TCL compounds and TAL analytes: solvents, chlorinated solvents, polycyclic aromatic hydrocarbons (PAHs), pesticides, common laboratory artifacts, common soil constituents, and metals (see Table 4-1 for complete soil sample chemical analysis results).

Analysis of FIT-collected residential and municipal well samples revealed substances from the following groups of TCL compounds and TAL analytes: halogenated hydrocarbons, common laboratory artifacts, common groundwater constituents, and metals (See Table 4-2 for complete residential and municipal well sample chemical analysis results).

Laboratory analytical data of soil sample analysis and residential and municipal well sample analysis and contract Laboratory Program (CLP) quantitation/detection limits are provided in Appendix D.

Table 4-2
RESULTS OF CHEMICAL ANALYSIS OF
FIT-COLLECTED RESIDENTIAL AND MUNICIPAL WELL SAMPLES

Sample Collection Information and Parameters	<u>Sample Number</u>					
	RW1	RW2	RW3	RW4	RW5 Duplicate	Blank
Date	10/22/87	10/22/87	10/22/87	10/22/87	10/22/87	10/22/87
Time	1025	1045	1145	1215	1030	1102
Organic Traffic Report Number	3048E01	3048E02	3048E03	3048E04	3048E05	3048E06
Inorganic Traffic Report Number	MER556	MER557	MER558	MER559	MER560	MER561
<u>Compound Detected</u>						
(values in $\mu\text{g/L}$)						
<u>Volatile Organics</u>						
chloroform	--	17	--	--	--	--
bromodichloromethane	--	4.3	--	--	--	--
<u>Semivolatile Organics</u>						
butylbenzylphthalate	--	--	--	--	--	1.2J
bis(2-ethylhexyl)phthalate	0.7J	--	0.6J	0.8J	--	76
di-n-octylphthalate	--	--	0.7J	0.6J	0.5J	1.4J
<u>Analyte Detected</u>						
(values in $\mu\text{g/L}$)						
arsenic	25	12	23	24	22	--
barium	337	403	325	253	331	--
cadmium	1.4J	[.37]	--	1.05	.75J	2.0
calcium	78,800	76,200	76,800	71,100	76,800	[206]
copper	120	48	18	11	21	--
iron	1,830	526J	3,190	2,640	1,530	201
lead	4.7J	4.9J	[1.1]	2.8J	[1.9J]	[1.9]
magnesium	27,500	26,500	27,000	30,600	27,100	[66]
manganese	137	38	124	153	133	--
mercury	0.5J	--	--	--	--	--

Table 4-2 Cont.

Sample Collection Information and Parameters	<u>Sample Number</u>					
	RW1	RW2	RW3	RW4	RW5	
					Duplicate	Blank
nickel	--	--	--	64	--	--
potassium	2,580	2,450	3,040	[1,240]	2,410	--
sodium	18,400	17,800	26,800	8,630	17,900	[662]
zinc	323	36	130	74	39	[7.4]

-- Not detected.

Table 4-2 Cont.

COMPOUND QUALIFIERS	DEFINITION	INTERPRETATION
J	Indicates an estimated value.	Compound value may be semiquantitative.

ANALYTE QUALIFIERS	DEFINITION	INTERPRETATION
[]	Value is real, but is above instrument DL and below CRDL.	Value may be quantitative or semi-quantitative.
J	Value is above CRDL and is an estimated value because of a QC protocol.	Value may be semiquantitative.

Source: Ecology and Environment, Inc. 1988.

Table 4-1
RESULTS OF CHEMICAL ANALYSIS OF
FIT-COLLECTED SOIL SAMPLES

Sample Collection Information and Parameters	<u>Sample Number</u>						
	S1	S2	S3	S4	S5	S6	S7
Date	10/21/87	10/21/87	10/21/87	10/21/87	10/21/87	10/21/87	10/22/87
Time	1025	1045	1120	1210	1315	1400	1445
Organic Traffic Report Number	EP939	EP940	EP941	EP942	EP943	EP944	EP945
Inorganic Traffic Report Number	436	437	438	439	440	554	555
<u>Compound Detected</u> (values in $\mu\text{g}/\text{kg}$)							
<u>Volatile Organics</u>							
methylene chloride	14B	2,100B	15B	15B	120,000B	99B	18B
acetone	--	2,300B	--	--	730,000B	110B	26B
chloroform	3JB	360JB	3JB	3JB	36,000JB	14JB	2JB
2-butanone (MEK)	--	--	--	--	280,000B	--	--
1,1,1-trichloroethane	--	--	--	--	--	8J	--
toluene	--	--	--	--	97,000	--	--
ethylbenzene	--	800	--	--	630,000	--	--
xylene (total)	--	23,000	38	55	2,900,000	--	25
<u>Semivolatile Organics</u>							
benzoic acid	--	4,300	--	--	--	--	--
naphthalene	--	2,900	--	--	2,200	--	--
2-methylnaphthalene	--	220J	--	--	--	--	--
phenanthrene	--	--	--	--	430JM	--	--
fluoranthene	--	--	--	110MJ	400J	--	--
pyrene	--	--	--	79MJ	--	--	--
bis(2-ethylhexyl)phthalate	560JB	460B	120JB	170JB	950JB	150JB	--
<u>Pesticides/PCBs</u>							
4,4'-DDE	--	--	--	--	--	--	6.5J
4,4'-DDT	--	--	--	--	--	--	15.8J

Table 4-1 Cont.

Sample Collection Information and Parameters	<u>Sample Number</u>						
	S1	S2	S3	S4	S5	S6	S7
<u>Analyte Detected</u> (values in mg/kg)							
aluminum	4,070*	3,660*	2,830*	3,860*	3,130*	4,620*	5,860*
antimony	29N*J	68N*J	40N*J	39N*J	38N*J	19N*J	30N*J
arsenic	3.3	2.6	2.8	2.6	3.0	2.5	4.9+
barium	536NE	47NE	[38]NE	57NE	78NE	61NE	98NE
cadmium	2.2	1.6	2.0	1.4	1.4	--	--
calcium	23,100*J	32,700*J	36,000*J	7,210*J	8,820*J	3,980*J	4,470*J
chromium	39N*EJ	2,580N*EJ	12N*EJ	38N*EJ	521N*EJ	12N*EJ	7.5N*EJ
cobalt	[11]	13	--	--	--	--	--
copper	7.4	6.6	6.4	13	7.8	[4.2]	6.7
iron	9,080	6,540	5,880	15,700	11,800	8,470	10,700
lead	121	6,890s	70	136	2,340s+	39s	36s
magnesium	7,570*J	15,300*J	16,800*J	2,420*J	2,900*J	1,880*J	2,170*J
manganese	356NJ	247NJ	273NJ	370NJ	219NJ	305NJ	548NJ
nickel	13	10	[6.2]	12	11	[6.1]	[7.5]
potassium	[519]E	[649]E	[687]E	[366]E	[658]E	[656]E	[925]E
sodium	--	[9.2]	--	--	--	--	[92]
thallium	--	--	--	--	--	--	[0.44]
vanadium	[10]	--	--	12	--	[10]	14
zinc	1,380*J	97*J	27*J	40*J	159*J	28*J	52*J

-- Not detected.

Table 4-1 Cont.

COMPOUND QUALIFIERS	DEFINITION	INTERPRETATION
J	Indicates an estimated value.	Compound value may be semiquantitative.
B	This flag is used when the compound is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.	Compound value may be semiquantitative if it is <5x the blank concentration (<10x the blank concentrations for common laboratory artifacts: phthalates, methylene chloride, acetone, toluene, 2-butanone).
ANALYTE QUALIFIERS	DEFINITION	INTERPRETATION
E	Estimated or not reported due to interference. See laboratory narrative.	Analyte or element was not detected, or value may be semiquantitative.
s	Analysis by Method of Standard Additions.	Value is quantitative.
N	Spike recoveries outside QC protocols, which indicates a possible matrix problem. Data may be biased high or low. See spike results and laboratory narrative.	Value may be quantitative or semiquantitative.
*	Duplicate value outside QC protocols which indicates a possible matrix problem.	Value may be quantitative or semiquantitative.
+	Correlation coefficient for standard additions is less than 0.995. See review and laboratory narrative.	Data value may be biased.
[]	Value is real, but is above instrument DL and below CRDL.	Value may be quantitative or semiquantitative.
J	Value is above CRDL and is an estimated value because of a QC protocol.	Value may be semiquantitative.
M	Duplicate injection precision not met.	Value may be semiquantitative.

Source: Ecology and Environment, Inc. 1988.

5. DISCUSSION OF MIGRATION PATHWAYS

5.1 INTRODUCTION

This section discusses data and information that apply to potential migration pathways and targets of TCL compounds and/or TAL analytes that may be attributable to the Palm Industries site.

The five migration pathways of concern discussed are groundwater, surface water, air, fire and explosion, and direct contact.

5.2 GROUNDWATER

TCL compounds and TAL analytes were detected in groundwater within a 1-mile radius of the site. Specific compounds detected were chloroform at 17 µg/L and bromodichloromethane at 4.3 µg/L in municipal well sample RW2. There were also elevated levels of some heavy metals detected in well samples. These contaminants cannot be conclusively attributed to the site because of the distances at which these samples were taken from the site.

There does exist a potential for TCL compounds and/or TAL analytes to migrate from the site to groundwater in the vicinity of the site. This potential is based on the following information:

- TCL compounds and TAL analytes have been detected at the site;
- Waste has been deposited at the site as an unconsolidated solid and as a liquid;

- The site is not lined and does not have an impervious cover; and
- There are no leachate collection systems present at the site.

The potential for TCL compounds and/or TAL analytes to migrate to groundwater in the vicinity of the site is also based on the following geological information, which is derived from well logs of the area of the site the site (see Appendix E).

- The general geology of the area of the site consists of unconsolidated glacially derived deposits of sand, gravel, silt, and clay, which are approximately 200 feet thick and overlay a shale bedrock;
- The unconsolidated glacially deposited material forms the aquifer of concern in the area of the site;
- No other aquifers are utilized as sources of drinking water within a 3-mile radius of the site;
- The unsaturated zone in the area of the site is composed of a sandy clayey glacial till; and
- There are no continuous impermeable confining layers throughout a 3-mile radius of the site.

The potential targets of groundwater contamination include 7,000 persons within a 3-mile radius of the site who obtain drinking water from municipal or private wells drawing from the unconsolidated aquifer of concern.

According to Dick Warmbier, a water plant operator with the City of Litchfield Water Department, the City of Litchfield operates two municipal wells that are located approximately 1 mile south of the site. All the wells are screened in the aquifer of concern at depths of

approximately 150 feet. Approximately 6,000 persons obtain drinking water from the City of Litchfield municipal water system (Warmbier 1987).

According to a USGS topographic map of the area of the site, approximately 1,000 persons reside within a 3-mile radius of the site outside the corporate limits of the City of Litchfield. These residents obtain drinking water from private wells screened in the aquifer of concern at depths of approximately 50 to 200 feet (Warmbier 1987). The nearest well to the site is a private residential well located approximately 650 feet southeast of the site.

5.3 SURFACE WATER

No surface water samples were taken on- or off-site. A drainage ditch on the western border of the site was dry at the time of the inspection. The nearest surface water body to the site is Stone Lake, which lies approximately 1 mile west of the site. According to Mr. Fitlere of the Meeker County Assessor's Office, Stone Lake is not used for drinking water or for recreation. No surface water route exists between the site and Stone Lake.

5.4 AIR

A release of potential contaminants to the air was not documented during the SSI of the Palm Industries site. During the reconnaissance inspection, FIT site-entry instruments (radiation monitor, oxygen meter, colorimetric monitoring tubes for cyanide, explosimeter) did not detect levels above background concentrations at the site (E & E 1987). In accordance with the U.S. EPA-approved work plan, further air monitoring was not conducted by FIT.

A potential does exist for windblown particulates to carry TCL compounds and/or TAL analytes from the site.

5.5 FIRE AND EXPLOSION

FIT observations and explosimeter readings indicated that there is no apparent potential for fire and/or explosion at the site.

5.6 DIRECT CONTACT

According to federal, state, and local file information, and interviews with local officials, there is no documentation of an incident of direct contact with TCL compounds and/or TAL analytes at the Palm Industries site.

There is a potential that the public may come into direct contact with TCL compounds and/or TAL analytes detected at the site. The potential for direct contact is based on the following information:

- Access to the site is not completely restricted; the site perimeter is not fenced and there is no security guard or other means of security utilized at the site;
- TCL compounds and TAL analytes have been detected at the site; and
- Waste at the site is exposed and uncovered.

According to a USGS topographic map of the area of the site, the population within a 1-mile radius of the site is approximately 1,000 persons.

6. REFERENCES

Ecology and Environment, Inc., 1987, Quality Assurance Project Plan Region V FIT Conducted Site Inspections, Chicago, Illinois.

Fitlere, Mr., September 15, 1987, telephone conversation, Meeker County Assessor's Office, contacted by Matthew Arnold of FIT.

Mader, Terry J., June 1, 1983, Hazardous Waste Compliance and Enforcement Unit, letter to Mr. Edward L. Lyons, General Manager of Palm Industries.

MPCA, December 1986, Electromagnetic Exploration of a Suspected Contaminant Plume Near Litchfield, Minnesota.

MPCA, March 11, 1983, Complaint Report 515H.

MPCA, May 20, 1983, office memorandum.

MPCA, August 25, 1985, Potential Hazardous Waste Site Preliminary Assessment, for Palm Industries, Inc., Minnesota, U.S. EPA ID: MND044176394, prepared by Susan M. Cedarleaf.

MPCA, December 1985, Notice of Violation, submitted by Roger D. Bjork, Hazardous Waste Enforcement Unit, to Mr. Wesley Holmgren, Palm Industries, Inc.

Palm Industries, Inc., January 1984, Hazardous Waste Disclosure/
Hazardous Waste Management Plan, submitted to State of Minnesota.

Stone, Gary, May 13, 1988, telephone interview, Plant Manager of Palm Industries, Litchfield, Minnesota, interviewed by Matthew Arnold of FIT.

U.S. EPA, Office of Solid Waste and Emergency Response, February 12, 1988, Pre-Remedial Strategy for Implementing SARA, Directive number 9345.2-01, Washington, D.C.

U.S. Geological Survey, 1982, 1967, Litchfield North and South, Forest City, Darwin Quadrangles, Minnesota, 7.5 Minute Series: 1:24,000.

Warmbier, Dick, September 15, 1987, telephone conversation, Water Plant Operator of Litchfield Water Department, contacted by Matthew Arnold of FIT.

Wegwart, Gordon E., P.E., June 3, 1986, Chief, Hazardous Waste Section, MPCA, letter submitted to Mr. Wesley Holmgren of Palm Industries, Inc.

1119:5

APPENDIX A

SITE 4-MILE RADIUS MAP

SDMS US EPA Region V

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APPENDIX B

U.S. EPA FORM 2070-13



Site Inspection Report



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE 02 SITE NUMBER
MN 0044176394

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)
Palm Industries, INC.

02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
West Highway 12

03 CITY
Litchfield

04 STATE 05 ZIP CODE 06 COUNTY 07 COUNTY CODE 08 CONG DIST
MN 55355 Meeker 093 02

09 COORDINATES
LATITUDE 45° 08' 32.0" LONGITUDE 094° 32' 05.0"

10 TYPE OF OWNERSHIP (Check one)
☒ A. PRIVATE ☐ B. FEDERAL ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION
10/21/87

02 SITE STATUS
☒ ACTIVE ☐ INACTIVE

03 YEARS OF OPERATION
1970 present UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)
☐ A. EPA ☒ B. EPA CONTRACTOR Ecology & Environment ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR ☐ E. STATE ☐ F. STATE CONTRACTOR ☐ G. OTHER

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Matt Arnold	Environmental Specialist	E+E Inc	(312) 663-9415
09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Bob Kurzeja	Chemical Engineer	E+E, Inc.	(312) 663-9415
Gary Cobb	Geologist	E+E, Inc.	(312) 663-9415
Tom O'Brien	Biologist	E+E, Inc.	(312) 663-9415
Melanie Nesterenko	Biologist	E+E, Inc.	(312) 663-9415
Cathy Chaberski	Environmental Spec	E+E, Inc.	(312) 663-9415
13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO.
Gary Stone	Manager	West Highway 12, Litchfield	(612) 693-2497
			()
			()
			()
			()
			()
			()

17 ACCESS GAINED BY (Check one)
☒ PERMISSION ☐ WARRANT

18 TIME OF INSPECTION
9:00 AM

19 WEATHER CONDITIONS
Clear, 35°, winds from the Southeast

IV. INFORMATION AVAILABLE FROM

01 CONTACT
Ron Swenson

02 OF (Agency/Organization)
Minnesota Pollution Control Agency

03 TELEPHONE NO.
1602 1297-1793

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM
Matt Arnold

05 AGENCY
U.S.E.P.A

06 ORGANIZATION
E+E F.I.F

07 TELEPHONE NO.
(312) 663-9415

08 DATE
5/12/88



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE MN 02 SITE NUMBER 0044176394

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☒ A. SOLID
☐ B. POWDER, FINES
☐ C. SLUDGE
☐ D. OTHER _____
(Specify)
- ☐ E. SLURRY
☐ F. LIQUID
☐ G. GAS

02 WASTE QUANTITY AT SITE

(Measures of waste quantities must be independent)

TONS _____
CUBIC YARDS _____
NO. OF DRUMS ~ 30

03 WASTE CHARACTERISTICS (Check all that apply)

- ☒ A. TOXIC
☐ B. CORROSIVE
☐ C. RADIOACTIVE
☒ D. PERSISTENT
☐ E. SOLUBLE
☐ F. INFECTIOUS
☐ G. FLAMMABLE
☐ H. IGNITABLE
☐ I. HIGHLY VOLATILE
☐ J. EXPLOSIVE
☐ K. REACTIVE
☐ L. INCOMPATIBLE
☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	<u>SLUDGE</u>	<u>UNKNOWN</u>	<u>UNKNOWN</u>	<u>Amounts of waste types are not documented, and the present operator does not have this information available.</u>
OLW	<u>OILY WASTE</u>	"	"	
SOL	<u>SOLVENTS</u>	"	"	
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	<u>ACIDS</u>	"	"	
BAS	BASES			
MES	<u>HEAVY METALS</u>	"	"	

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
<u>Sol</u>	<u>toluene</u>	<u>108-88-3</u>	<u>Land Filled</u>	<u>97,000</u>	<u>mg/Kg</u>
<u>Sol</u>	<u>ethylbenzene</u>	<u>100-41-4</u>	"	<u>630,000</u>	<u>mg/Kg</u>
<u>Sol</u>	<u>xylene</u>	<u>1330-02-7</u>	"	<u>2,900,000</u>	<u>mg/Kg</u>
<u>OCC</u>	<u>benzoic acid</u>	<u>65-85-0</u>	"	<u>4,300</u>	<u>mg/Kg</u>
<u>OCC</u>	<u>Napthalene</u>	<u>91-20-3</u>	"	<u>2,900</u>	<u>mg/Kg</u>
<u>MES</u>	<u>Cadmium</u>	<u>7440-43-9</u>	"	<u>2.2</u>	<u>mg/Kg</u>
<u>MES</u>	<u>Cobalt</u>	<u>7440-48-4</u>	"	<u>13</u>	<u>mg/Kg</u>
<u>MES</u>	<u>copper</u>	<u>7440-50-8</u>	"	<u>7.8</u>	<u>mg/Kg</u>
<u>MES</u>	<u>lead</u>	<u>7439-92-1</u>	"	<u>68,905</u>	<u>mg/Kg</u>
<u>Sol</u>	<u>1,1,1-trichloroethane</u>	<u>71-55-6</u>	"	<u>8 J</u>	<u>mg/Kg</u>
<u>PAH</u>	<u>phenanthrene</u>	<u>85-01-8</u>	"	<u>430 J</u>	<u>mg/Kg</u>
<u>PAH</u>	<u>fluoranthene</u>	<u>206-44-0</u>	"	<u>400 JM</u>	<u>mg/Kg</u>
<u>OCC</u>	<u>PYRENE</u>	<u>129-00-0</u>	"	<u>79 JM</u>	<u>mg/Kg</u>
<u>MES</u>	<u>ANTIMONY</u>	<u>7440-36-0</u>	"	<u>40 NES</u>	<u>mg/Kg</u>
<u>MES</u>	<u>Chromium</u>	<u>7440-47-3</u>	"	<u>2,580 NES</u>	<u>mg/Kg</u>

V. FEEDSTOCKS (See Appendix for CAS Numbers) NIA

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

FIT SSI Conducted 10/21/87.
FIT Files



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE 02 SITE NUMBER
MN 0044176394

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION ~7,000 02 ☒ OBSERVED (DATE: 10/21/87) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ~7,000 04 NARRATIVE DESCRIPTION
TCL compounds and THL analytes were detected in groundwater within a 1-mile radius of the site. Attribution to the site is inconclusive due to the distance at which the compounds were detected (municipal well samples). There is a potential for groundwater contamination as TCL compounds were detected in on-site soil samples and there are private wells drawing water from the aquifer of concern at depths of 50-200 feet.

01 ☒ B. SURFACE WATER CONTAMINATION ~7000 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ~7000 04 NARRATIVE DESCRIPTION
No surface water was sampled, although there is a drainage ditch which was dry at the time of the inspection.

01 ☒ C. CONTAMINATION OF AIR _____ 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
There does exist a potential for contamination of air based on photoionizer readings of 30-50 ppm benzene equivalents obtained while taking soil samples on-site.

01 ☒ D. FIRE/EXPLOSIVE CONDITIONS _____ 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
A potential exists based on elevated levels of solvents detected in soil on-site, as well as leaking drums. Photo-ionizer readings of soil samples indicated 30-50 ppm benzene equivalents. (See II.C.04)

01 ☒ E. DIRECT CONTACT ~100 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ~100 04 NARRATIVE DESCRIPTION
A potential exists due to poor containment of waste and accessibility of the disposal area due to lack of security. There are 100 employees at the facility.

01 ☒ F. CONTAMINATION OF SOIL ~10 02 ☒ OBSERVED (DATE: 10/21/87) ☐ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: ~10 04 NARRATIVE DESCRIPTION
(Acres)
TCL compounds, such as solvents, were detected at elevated levels in the on-site soil samples.

01 ☒ G. DRINKING WATER CONTAMINATION 7,000 02 ☒ OBSERVED (DATE: 10/21/87) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 7,000 04 NARRATIVE DESCRIPTION
Analytical data indicates that contaminants were present in the drinking water samples taken. Samples were taken from private and municipal wells. Drinking water is obtained from the aquifer of concern.

01 ☒ H. WORKER EXPOSURE/INJURY ~100 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: ~100 04 NARRATIVE DESCRIPTION
A potential exists due to poor containment and accessibility of waste (See A and E above).

01 ☒ I. POPULATION EXPOSURE/INJURY ~4000 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ~4000 04 NARRATIVE DESCRIPTION
A potential exists due to poor waste containment and accessibility of the site (See A and E above).



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE 02 SITE NUMBER
MN 0044176394

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☒ J. DAMAGE TO FLORA
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE: _____)

☒ POTENTIAL ☐ ALLEGED

A potential exists due to unstable containment of waste. Leaking drums deposited waste directly on the soil surface.

01 ☒ K. DAMAGE TO FAUNA
04 NARRATIVE DESCRIPTION (include name(s) of species)

02 ☐ OBSERVED (DATE: _____)

☒ POTENTIAL ☐ ALLEGED

A potential exists due to the accessibility of the waste.

01 ☒ L. CONTAMINATION OF FOOD CHAIN
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE: _____)

☒ POTENTIAL ☐ ALLEGED

A potential exists due to the close proximity of prime agricultural land.

01 ☒ M. UNSTABLE CONTAINMENT OF WASTES
(Spills/Runoff/Standing Liquids, Leaking Drums)

02 ☒ OBSERVED (DATE: 10/21/87)

☐ POTENTIAL ☐ ALLEGED

03 POPULATION POTENTIALLY AFFECTED: ~7,000

04 NARRATIVE DESCRIPTION

Leaking drums were observed on site.

01 ☒ N. DAMAGE TO OFFSITE PROPERTY
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE: _____)

☒ POTENTIAL ☐ ALLEGED

Deteriorating drums and unstable containment of wastes were observed. Some of the drums were near a drainage ditch and may carry waste off site.

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE: _____)

☐ POTENTIAL ☐ ALLEGED

None documented or observed.

01 ☒ P. ILLEGAL/UNAUTHORIZED DUMPING
04 NARRATIVE DESCRIPTION

02 ☐ OBSERVED (DATE: _____)

☒ POTENTIAL ☐ ALLEGED

Unauthorized dumping may have occurred, although no documentation is available.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

None documented.

III. TOTAL POPULATION POTENTIALLY AFFECTED: ~7,000

IV. COMMENTS

Unstable containment of wastes as well as inadequate storage and inadequate integrity of drums were observed during the inspection.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

FIT SSI Conducted 10/21/87



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE MN 02 SITE NUMBER 0044176394

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
<input type="checkbox"/> A. NPDES				
<input type="checkbox"/> B. UIC				
<input type="checkbox"/> C. AIR				
<input checked="" type="checkbox"/> D. RCRA	<u>UNKNOWN</u>			<u>Small quantity generator.</u> <u>Permit information was</u> <u>not available.</u>
<input type="checkbox"/> E. RCRA INTERIM STATUS				
<input type="checkbox"/> F. SPCC PLAN				
<input checked="" type="checkbox"/> G. STATE (Specify)	<u>UNKNOWN</u>			
<input checked="" type="checkbox"/> H. LOCAL (Specify)	<u>UNKNOWN</u>			
<input type="checkbox"/> I. OTHER (Specify)				
<input type="checkbox"/> J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE	04 TREATMENT (Check all that apply)	05 OTHER
<input type="checkbox"/> A. SURFACE IMPOUNDMENT			<input type="checkbox"/> A. INCINERATION	<input checked="" type="checkbox"/> A. BUILDINGS ON SITE <u>1</u>
<input type="checkbox"/> B. PILES			<input type="checkbox"/> B. UNDERGROUND INJECTION	
<input checked="" type="checkbox"/> C. DRUMS, ABOVE GROUND	<u>~30</u>	<u>55 gallons</u>	<input type="checkbox"/> C. CHEMICAL/PHYSICAL	06 AREA OF SITE <u>~10</u> (Acres)
<input type="checkbox"/> D. TANK, ABOVE GROUND			<input type="checkbox"/> D. BIOLOGICAL	
<input type="checkbox"/> E. TANK, BELOW GROUND			<input type="checkbox"/> E. WASTE OIL PROCESSING	
<input checked="" type="checkbox"/> F. LANDFILL	<u>~1</u>	<u>acre</u>	<input type="checkbox"/> F. SOLVENT RECOVERY	
<input type="checkbox"/> G. LANDFARM			<input type="checkbox"/> G. OTHER RECYCLING/RECOVERY	
<input checked="" type="checkbox"/> H. OPEN DUMP	<u>~2</u>	<u>acre</u>	<input type="checkbox"/> H. OTHER <u>N/A</u> (Specify)	
<input type="checkbox"/> I. OTHER (Specify)				

07 COMMENTS

Disposal of metal fabrication waste is spread on the ground over
approximately a 2-acre area in the rear of the plant. Also
55 gallon drums are present on site and in a deteriorating
state. Waste was also burned and buried in trenches on
site.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☒ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

Drums are scattered randomly throughout the disposal area.
Some of the drums were deteriorating and observed to be leaking.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☒ YES ☐ NO

02 COMMENTS

Waste is lying on the surface near the disposal area.
The site is not fenced and is accessible from all directions.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

FIT SSI conducted 10/21/87.
FIT files.
MPCA files.



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE 02 SITE NUMBER
MA 0044176394

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY
(Check as applicable)

SURFACE WELL
COMMUNITY A. ☐ B. ☒
NON-COMMUNITY C. ☐ D. ☒

02 STATUS

ENDANGERED AFFECTED MONITORED
A. ☐ B. ☒ C. ☒
D. ☐ E. ☒ F. ☐

03 DISTANCE TO SITE

A. ~1 (mi)
B. < 1/4 (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☒ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING
(Other sources available)
COMMERCIAL, INDUSTRIAL, IRRIGATION
(No other water sources available)
☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION
(Limited other sources available)
☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER ~7,000

03 DISTANCE TO NEAREST DRINKING WATER WELL < 1/4 (mi)

04 DEPTH TO GROUNDWATER
~50 (ft)

05 DIRECTION OF GROUNDWATER FLOW
West

06 DEPTH TO AQUIFER
OF CONCERN
50 (ft)

07 POTENTIAL YIELD
OF AQUIFER
UNKNOWN (gpd)

08 SOLE SOURCE AQUIFER
YES ☐ NO ☒

09 DESCRIPTION OF WELLS (including usage, depth, and location relative to population and buildings)

Wells in the area used for drinking water are approximately 50-120 feet deep. The water table in the area is very high (up to 20 feet). These wells draw from sand and gravel which is the aquifer of concern.

10 RECHARGE AREA

☒ YES COMMENTS
☐ NO Via percolation

11 DISCHARGE AREA

☐ YES COMMENTS
☐ NO UNKNOWN

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☐ A. RESERVOIR, RECREATION
DRINKING WATER SOURCE ☐ B. IRRIGATION, ECONOMICALLY
IMPORTANT RESOURCES ☐ C. COMMERCIAL, INDUSTRIAL ☒ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:

AFFECTED

DISTANCE TO SITE

N/A ☐ N/A (mi)
☐ ☐ (mi)
☐ ☐ (mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE
A. ~4,000
NO. OF PERSONS

TWO (2) MILES OF SITE
B. ~6,000
NO. OF PERSONS

THREE (3) MILES OF SITE
C. ~7,000
NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION

< 1/8 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE

100

04 DISTANCE TO NEAREST OFF-SITE BUILDING

< 1/8 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

The population within the vicinity of the site is mostly rural to the east, north and west. South of the site is the town of Litchfield.



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE 02 SITE NUMBER

MN 0044/26394

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☒ B. $10^{-4} - 10^{-6}$ cm/sec ☐ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE
(Less than 10^{-8} cm/sec) ☒ B. RELATIVELY IMPERMEABLE
($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE
($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE
(Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK

~140 (ft)

04 DEPTH OF CONTAMINATED SOIL ZONE

≥ 10 (ft)

05 SOIL pH

Unknown

06 NET PRECIPITATION

.57 (in)

07 ONE YEAR 24 HOUR RAINFALL

2.25 (in)

08 SLOPE

SITE SLOPE
1.7 %

DIRECTION OF SITE SLOPE

West

TERRAIN AVERAGE SLOPE

< 3% %

09 FLOOD POTENTIAL

SITE IS IN Unknown YEAR FLOODPLAIN

10

N/A

☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE

A. N/A (mi)

OTHER

B. < 1/4 (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

(mi)

ENDANGERED SPECIES: N/A

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL

RESIDENTIAL AREAS; NATIONAL/STATE PARKS,
FORESTS, OR WILDLIFE RESERVES

AGRICULTURAL LANDS
PRIME AG LAND AG LAND

A. < 1/4 (mi)

B. < 1/4 (mi)

C. < 1/8 (mi)

D. < 1/2 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

Refer to Appendix A.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

USGS topographic Maps.
Minnesota Geological Survey.



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION

01 STATE 02 SITE NUMBER
MN 12044176394

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER	4	Southwest Laboratory of Oklahoma Tulsa OK, Associated Laboratories of Orange Calif.	ON FILE
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL	7	CENRE Labs Brighton, Colorado, Cambridge Analytical ASSO of Boston Mass.	ON FILE
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
Photo-ionization unit	Readings were 30-50ppm for soil sampling
Oxygen meter	No readings were outside 18.5 to 25.0% O ₂
Exposimeter	No readings were above 0% LEL.
Radiation monitor	No readings were above background.

IV. PHOTOGRAPHS AND MAPS

01 TYPE <input checked="" type="checkbox"/> GROUND <input type="checkbox"/> AERIAL	02 IN CUSTODY OF Ecology & Environment Inc., Chicago, IL (Name of organization or individual)
03 MAPS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	04 LOCATION OF MAPS Ecology & Environment Inc., files.

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

None.

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

FIT SSI conducted 10/22/87.



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION

01 STATE *MN* 02 SITE NUMBER *DOH41.76794*

II. CURRENT OWNER(S)				PARENT COMPANY (if applicable)			
01 NAME <i>Palm Industries</i>		02 D+B NUMBER		08 NAME <i>LORAM</i>		09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.) <i>West Highway 12</i>		04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.) <i>Highway 55</i>		11 SIC CODE	
05 CITY <i>Litchfield</i>		06 STATE <i>MN</i>	07 ZIP CODE <i>55355</i>	12 CITY <i>Hamel</i>		13 STATE <i>MN</i>	14 ZIP CODE <i>55340</i>
01 NAME		02 D+B NUMBER		08 NAME		09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE	
05 CITY		06 STATE	07 ZIP CODE	12 CITY		13 STATE	14 ZIP CODE
01 NAME		02 D+B NUMBER		08 NAME		09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE	
05 CITY		06 STATE	07 ZIP CODE	12 CITY		13 STATE	14 ZIP CODE
01 NAME		02 D+B NUMBER		08 NAME		09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE	
05 CITY		06 STATE	07 ZIP CODE	12 CITY		13 STATE	14 ZIP CODE
01 NAME		02 D+B NUMBER		08 NAME		09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE	
05 CITY		06 STATE	07 ZIP CODE	12 CITY		13 STATE	14 ZIP CODE
III. PREVIOUS OWNER(S) (List most recent first)				IV. REALTY OWNER(S) (if applicable, list most recent first)			
01 NAME <i>Round horse Company</i>		02 D+B NUMBER		01 NAME		02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.) <i>County RD. 18 near Highway 100</i>		04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	
05 CITY <i>Minneapolis</i>		06 STATE <i>MN</i>	07 ZIP CODE <i>55423</i>	05 CITY		06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER		01 NAME		02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	
05 CITY		06 STATE	07 ZIP CODE	05 CITY		06 STATE	07 ZIP CODE
01 NAME <i>Mr. Harlan Palm</i>		02 D+B NUMBER		01 NAME		02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.) <i>UNKNOWN</i>		04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	
05 CITY <i>Grove City</i>		06 STATE <i>MN</i>	07 ZIP CODE	05 CITY		06 STATE	07 ZIP CODE
V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)							
<i>FIT Piles.</i> <i>MPLA Piles.</i>							



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION

01 STATE 02 SITE NUMBER

MN 0044176394

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME
Palm Industries

02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)

West Highway 12

04 SIC CODE

05 CITY

Litchfield

06 STATE

MN

07 ZIP CODE

55355

08 YEARS OF OPERATION

1470 to present

09 NAME OF OWNER

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME

Loram

11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)

Highway 55

13 SIC CODE

14 CITY

Hamel

15 STATE

MN

16 ZIP CODE

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)

01 NAME
Roundhorst Company

02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)

County Rd. 18 near Highway 100

04 SIC CODE

05 CITY

Minneapolis

06 STATE

MN

07 ZIP CODE

08 YEARS OF OPERATION

09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME

11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)

13 SIC CODE

14 CITY

15 STATE

16 ZIP CODE

01 NAME
Mr. Harlan Palm

02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)

05 CITY

Grove City

06 STATE

MN

07 ZIP CODE

08 YEARS OF OPERATION

09 NAME OF OWNER DURING THIS PERIOD

01 NAME

02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)

04 SIC CODE

05 CITY

06 STATE

07 ZIP CODE

08 YEARS OF OPERATION

09 NAME OF OWNER DURING THIS PERIOD

10 NAME

11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)

13 SIC CODE

14 CITY

15 STATE

16 ZIP CODE

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis reports)

MPLA file information



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION

01 STATE 02 SITE NUMBER
MN D044176394

II. ON-SITE GENERATOR

01 NAME Palm Industries	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.) West Highway 12	04 SIC CODE
05 CITY Litchfield	06 STATE MN
07 ZIP CODE 55355	

III. OFF-SITE GENERATOR(S)

01 NAME N/A	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE	05 CITY	06 STATE
07 ZIP CODE		07 ZIP CODE	
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE	05 CITY	06 STATE
07 ZIP CODE		07 ZIP CODE	

IV. TRANSPORTER(S)

01 NAME Solv-Oil Service	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.) 6401 Inds Drive, Box 338	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY Minneapolis	06 STATE MN	05 CITY	06 STATE
07 ZIP CODE 55343		07 ZIP CODE	
01 NAME Worum Chemical	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.) 2130 Kasota Ave.	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY ST. Paul	06 STATE MN	05 CITY	06 STATE
07 ZIP CODE 55108		07 ZIP CODE	

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

MPLA File information.



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE 02 SITE NUMBER
MN 0644176394

II. PAST RESPONSE ACTIVITIES

01 <input type="checkbox"/> A. WATER SUPPLY CLOSED 04 DESCRIPTION	02 DATE	03 AGENCY
N/A		
01 <input type="checkbox"/> B. TEMPORARY WATER SUPPLY PROVIDED 04 DESCRIPTION	02 DATE	03 AGENCY
N/A		
01 <input type="checkbox"/> C. PERMANENT WATER SUPPLY PROVIDED 04 DESCRIPTION	02 DATE	03 AGENCY
N/A		
01 <input type="checkbox"/> D. SPILLED MATERIAL REMOVED 04 DESCRIPTION	02 DATE	03 AGENCY
N/A		
01 <input type="checkbox"/> E. CONTAMINATED SOIL REMOVED 04 DESCRIPTION	02 DATE	03 AGENCY
N/A		
01 <input type="checkbox"/> F. WASTE REPACKAGED 04 DESCRIPTION	02 DATE	03 AGENCY
N/A		
01 <input type="checkbox"/> G. WASTE DISPOSED ELSEWHERE 04 DESCRIPTION	02 DATE	03 AGENCY
N/A		
01 <input type="checkbox"/> H. ON SITE BURIAL 04 DESCRIPTION	02 DATE	03 AGENCY
N/A		
01 <input type="checkbox"/> I. IN SITU CHEMICAL TREATMENT 04 DESCRIPTION	02 DATE	03 AGENCY
N/A		
01 <input type="checkbox"/> J. IN SITU BIOLOGICAL TREATMENT 04 DESCRIPTION	02 DATE	03 AGENCY
N/A		
01 <input type="checkbox"/> K. IN SITU PHYSICAL TREATMENT 04 DESCRIPTION	02 DATE	03 AGENCY
N/A		
01 <input type="checkbox"/> L. ENCAPSULATION 04 DESCRIPTION	02 DATE	03 AGENCY
N/A		
01 <input type="checkbox"/> M. EMERGENCY WASTE TREATMENT 04 DESCRIPTION	02 DATE	03 AGENCY
N/A		
01 <input type="checkbox"/> N. CUTOFF WALLS 04 DESCRIPTION	02 DATE	03 AGENCY
N/A		
01 <input type="checkbox"/> O. EMERGENCY DIKING/SURFACE WATER DIVERSION 04 DESCRIPTION	02 DATE	03 AGENCY
N/A		
01 <input type="checkbox"/> P. CUTOFF TRENCHES/SUMP 04 DESCRIPTION	02 DATE	03 AGENCY
N/A		
01 <input type="checkbox"/> Q. SUBSURFACE CUTOFF WALL 04 DESCRIPTION	02 DATE	03 AGENCY
N/A		



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

L IDENTIFICATION

01 STATE 02 SITE NUMBER
MN 1044176394

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED
04 DESCRIPTION

02 DATE

03 AGENCY

N/A

01 ☐ S. CAPPING/COVERING
04 DESCRIPTION

02 DATE

03 AGENCY

N/A

01 ☐ T. BULK TANKAGE REPAIRED
04 DESCRIPTION

02 DATE

03 AGENCY

N/A

01 ☐ U. GROUT CURTAIN CONSTRUCTED
04 DESCRIPTION

02 DATE

03 AGENCY

N/A

01 ☐ V. BOTTOM SEALED
04 DESCRIPTION

02 DATE

03 AGENCY

N/A

01 ☐ W. GAS CONTROL
04 DESCRIPTION

02 DATE

03 AGENCY

N/A

01 ☐ X. FIRE CONTROL
04 DESCRIPTION

02 DATE

03 AGENCY

N/A

01 ☐ Y. LEACHATE TREATMENT
04 DESCRIPTION

02 DATE

03 AGENCY

N/A

01 ☐ Z. AREA EVACUATED
04 DESCRIPTION

02 DATE

03 AGENCY

N/A

01 ☐ 1. ACCESS TO SITE RESTRICTED
04 DESCRIPTION

02 DATE

03 AGENCY

N/A

01 ☐ 2. POPULATION RELOCATED
04 DESCRIPTION

02 DATE

03 AGENCY

N/A

01 ☐ 3. OTHER REMEDIAL ACTIVITIES
04 DESCRIPTION

02 DATE

03 AGENCY

None documented.

III SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

MPCA Files



POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION

01 STATE 02 SITE NUMBER
MN 0044776394

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☐ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

A complaint was issued on May 20, 1983 by Kenneth R. Madison, MPCA Region V - Marshall complaint No. 515H, improper storage of waste.

Regulatory enforcement action was taken on May 10, 1985 by Kathryn J. Kramer, Hazardous Waste Enforcement Unit, Regulatory Compliance Section, Solid and Hazardous Waste Division of MPCA.

On December 11, 1985 a notice of violation was issued by Rodney E. Massey, P. E. Chief, Regulatory Compliance Section.

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

MPCA files

APPENDIX C

FIT SITE PHOTOGRAPHS

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: PALM INDUSTRIES INC. PAGE 1 OF 17

U.S. EPA ID: MND044176394 TDD: F05-8707-016 PAN: FMN 01165A

DATE: > 10/21/87

TIME: > 0900

DIRECTION OF
PHOTOGRAPH:
> Northeast

WEATHER
CONDITIONS:
> Overcast
> 40°

PHOTOGRAPHED BY:
> Matt Arnold

SAMPLE ID
(if applicable):
> N/A



DESCRIPTION: > Palm Industries plant.
> North Highway 12 is in the foreground.

DATE: > 10/21/87

TIME: > 0910

DIRECTION OF
PHOTOGRAPH:
> West

WEATHER
CONDITIONS:
> Overcast
> 40°

PHOTOGRAPHED BY:
> MATT Arnold

SAMPLE ID
(if applicable):
> N/A



DESCRIPTION: > 55-gallon drums
> Disposal area in the rear of the plant.

SITE NAME: PALM INDUSTRIES INC.

PAGE 2 OF 17

U.S. EPA ID: MNDC44176394TDD: F05-8707-016PAN: FMMN01165ADATE: > 10/21/87TIME: > 0921DIRECTION OF
PHOTOGRAPH:> SoutheastWEATHER
CONDITIONS:> Overcast> 40°

PHOTOGRAPHED BY:

> Matt ArnoldSAMPLE ID
(if applicable):> N/ADESCRIPTION: > Disposal Area.> Access road to disposal area.DATE: > 10/21/87TIME: > 0922DIRECTION OF
PHOTOGRAPH:> WestWEATHER
CONDITIONS:> Overcast> 40°

PHOTOGRAPHED BY:

> Matt ArnoldSAMPLE ID
(if applicable):> N/ADESCRIPTION: > Disposal area.> Access path between burial pits.

SITE NAME: PALM INDUSTRIES INC.

PAGE 3 OF 17

U.S. EPA ID: MND044176394TDD: F05-8707-016PAN: FMN 01165ADATE: > 10/21/87TIME: > 0925DIRECTION OF
PHOTOGRAPH:> NorthwestWEATHER
CONDITIONS:> Overcast> 40°

PHOTOGRAPHED BY:

> Matt ArnoldSAMPLE ID
(if applicable):> N/ADESCRIPTION: > Disposal area.> Old tractor and scrap metal.DATE: > 10/21/87TIME: > 0925DIRECTION OF
PHOTOGRAPH:> SouthwestWEATHER
CONDITIONS:> Overcast> 40°

PHOTOGRAPHED BY:

> Matt ArnoldSAMPLE ID
(if applicable):> N/ADESCRIPTION: > Scrap metal storage area.> 55-gallon drums scattered randomly.

SITE NAME: PALM INDUSTRIES INC.

PAGE 4 OF 17

U.S. EPA ID: MND044176394TDD: F05-8707-016PAN: FMN01165ADATE: > 10/21/87TIME: > 0930DIRECTION OF
PHOTOGRAPH:> NorthwestWEATHER
CONDITIONS:> Overcast> 40°

PHOTOGRAPHED BY:

> Matt ArnoldSAMPLE ID
(if applicable):> N/ADESCRIPTION: > Scrap metal disposal area.> Note farm in far background.DATE: > 10/21/87TIME: >DIRECTION OF
PHOTOGRAPH:> N/AWEATHER
CONDITIONS:> Overcast> 40°

PHOTOGRAPHED BY:

> Matt ArnoldSAMPLE ID
(if applicable):> N/ADESCRIPTION: > Drum disposal pile.> Note label on the drum.

SITE NAME: PALM INDUSTRIES INC.

PAGE 5 OF 17

U.S. EPA ID: MND044176394TDD: F05-8707-016PAN: FMN01165ADATE: > 10/21/87TIME: > 0935DIRECTION OF
PHOTOGRAPH:> SouthwestWEATHER
CONDITIONS:> Overcast> 40°

PHOTOGRAPHED BY:

> Matt ArnoldSAMPLE ID
(if applicable):> N/ADESCRIPTION: > Drum disposal pile.> Note farmland in background.DATE: > 10/21/87TIME: > 0940DIRECTION OF
PHOTOGRAPH:> N/AWEATHER
CONDITIONS:> Overcast> 40°

PHOTOGRAPHED BY:

> Matt ArnoldSAMPLE ID
(if applicable):> N/ADESCRIPTION: > Waste from a deteriorated drum on the> soil surface.

SITE NAME: PALM INDUSTRIES INC.PAGE 6 OF 17U.S. EPA ID: MND044176394TDD: F05-8707-016PAN: FMN01165ADATE: > 10/21/87TIME: > 1025DIRECTION OF
PHOTOGRAPH:> NorthwestWEATHER
CONDITIONS:> Overcast> 40°

PHOTOGRAPHED BY:

> Matt ArnoldSAMPLE ID
(if applicable):> 51DESCRIPTION: > Sample 51 at drum disposal area.> Close up.DATE: > 10/21/87TIME: > 1025DIRECTION OF
PHOTOGRAPH:> NorthwestWEATHER
CONDITIONS:> Overcast> 40°

PHOTOGRAPHED BY:

> Matt ArnoldSAMPLE ID
(if applicable):> 51DESCRIPTION: > Sample 51 at drum disposal pile.> Panoramic view.

SITE NAME: PALM INDUSTRIES INC.

PAGE 7 OF 17

U.S. EPA ID: MND044176394TDD: F05-8707-016PAN: FMN01165ADATE: > 10/21/87TIME: > 1045DIRECTION OF
PHOTOGRAPH:> West

WEATHER

CONDITIONS:

> Overcast to> partly cloudy 40°

PHOTOGRAPHED BY:

> Matt Arnold

SAMPLE ID

(if applicable):

> S2DESCRIPTION: > Sample S2 behind drum disposal pile.> Close up.DATE: > 10/21/87TIME: > 1045DIRECTION OF
PHOTOGRAPH:> Northwest

WEATHER

CONDITIONS:

> Overcast to> partly cloudy 40°

PHOTOGRAPHED BY:

> Matt Arnold

SAMPLE ID

(if applicable):

> S2DESCRIPTION: > Sample S2 panoramic view

>

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: PALM INDUSTRIES INC.PAGE 8 OF 17U.S. EPA ID: MND044176394 TDD: F05-8707-016PAN: FMN01165ADATE: > 10/21/87TIME: > 1120DIRECTION OF
PHOTOGRAPH:> North

WEATHER

CONDITIONS:

> Partly cloudy> 40°

PHOTOGRAPHED BY:

> Matt Arnold

SAMPLE ID

(if applicable):

> S3DESCRIPTION: > Sample S3, panoramic view.

>

DATE: > 10/21/87TIME: > 1120DIRECTION OF
PHOTOGRAPH:> North

WEATHER

CONDITIONS:

> Partly cloudy> 40°

PHOTOGRAPHED BY:

> Matt Arnold

SAMPLE ID

(if applicable):

> S3DESCRIPTION: > Sample S3, close-up. view.

>

SITE NAME: PALM INDUSTRIES INC.

PAGE 9 OF 17

U.S. EPA ID: MND044176394TDD: F05-8707-016PAN: FMN01165ADATE: > 10/21/87TIME: > 1210DIRECTION OF
PHOTOGRAPH:> WestWEATHER
CONDITIONS:> Partly cloudy> 40°

PHOTOGRAPHED BY:

> Matt ArnoldSAMPLE ID
(if applicable):> S4DESCRIPTION: > Sample S4, close-up view.>DATE: > 10/21/87TIME: > 1210DIRECTION OF
PHOTOGRAPH:> WestWEATHER
CONDITIONS:> Partly Cloudy> 40°

PHOTOGRAPHED BY:

> Matt ArnoldSAMPLE ID
(if applicable):> S4DESCRIPTION: > Sample S4, panoramic view.>

SITE NAME: PALM INDUSTRIES INC.PAGE 10 OF 17U.S. EPA ID: MND044176394 TDD: F05-8707-016PAN: FMN 01165ADATE: > 10/21/87TIME: > 1315DIRECTION OF
PHOTOGRAPH:> Northwest

WEATHER

CONDITIONS:

> Overcast> 40°

PHOTOGRAPHED BY:

> Matt Arnold

SAMPLE ID

(if applicable):

> 55DESCRIPTION: >Sample 55, panoramic view>DATE: > 10/21/87TIME: > 13:15DIRECTION OF
PHOTOGRAPH:> Northwest

WEATHER

CONDITIONS:

> Overcast> 40°

PHOTOGRAPHED BY:

> Matt Arnold

SAMPLE ID

(if applicable):

> 55DESCRIPTION: >Sample 55, close-up view.>

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: PALM INDUSTRIES INC.

PAGE 11 OF 17

U.S. EPA ID: MND044176394TDD: F05-8707-016

PAN: FMN 01165A

DATE: > 10/21/87

TIME: > 1400

DIRECTION OF
PHOTOGRAPH:

> Northwest

WEATHER

CONDITIONS:

> Overcast

> 40°

PHOTOGRAPHED BY:

> Matt Arnold

SAMPLE ID

(if applicable):

> 56



DESCRIPTION: > Sample 56, close-up view.

>

DATE: > 10/21/87

TIME: > 1400

DIRECTION OF
PHOTOGRAPH:

> Northwest

WEATHER

CONDITIONS:

> Overcast

> 40°

PHOTOGRAPHED BY:

> Matt Arnold

SAMPLE ID

(if applicable):

> 56



DESCRIPTION: > Sample 56, close-up view.

>

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: PALM INDUSTRIES INC.

PAGE 12 OF 17

U.S. EPA ID: MND044176394TDD: F05-8707-016PAN: FMN01165ADATE: > 10/21/87TIME: > 1445DIRECTION OF
PHOTOGRAPH:> EastWEATHER
CONDITIONS:> Overcast> 40°

PHOTOGRAPHED BY:

> Matt ArnoldSAMPLE ID
(if applicable):> 57DESCRIPTION: > Sample 57, close-up view> Background sample (potential).DATE: > 10/21/87TIME: > 1445DIRECTION OF
PHOTOGRAPH:> EastWEATHER
CONDITIONS:> Overcast> 40°

PHOTOGRAPHED BY:

> Matt ArnoldSAMPLE ID
(if applicable):> 57DESCRIPTION: > Sample 57, panoramic view> Background sample (potential).

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: PALM INDUSTRIES INC. PAGE 13 OF 17U.S. EPA ID: MND044176394 TDD: F05-8707-016 PAN: FMN 01165ADATE: > 10/22/87TIME: > 10 25DIRECTION OF
PHOTOGRAPH:> EastWEATHER
CONDITIONS:> Clear> 45°

PHOTOGRAPHED BY:

> Matt ArnoldSAMPLE ID
(if applicable):> RW1DESCRIPTION: > Municipal well #14, close-up
> North Miller Street, Litchfield.DATE: > 10/22/87TIME: > 10 25DIRECTION OF
PHOTOGRAPH:> EastWEATHER
CONDITIONS:> Clear> 45°

PHOTOGRAPHED BY:

> MATT ArnoldSAMPLE ID
(if applicable):> RW1DESCRIPTION: > Municipal well #14, panoramic view
> North Miller Street, Litchfield.

FIELD PHOTOGRAPHY LOG SHEET

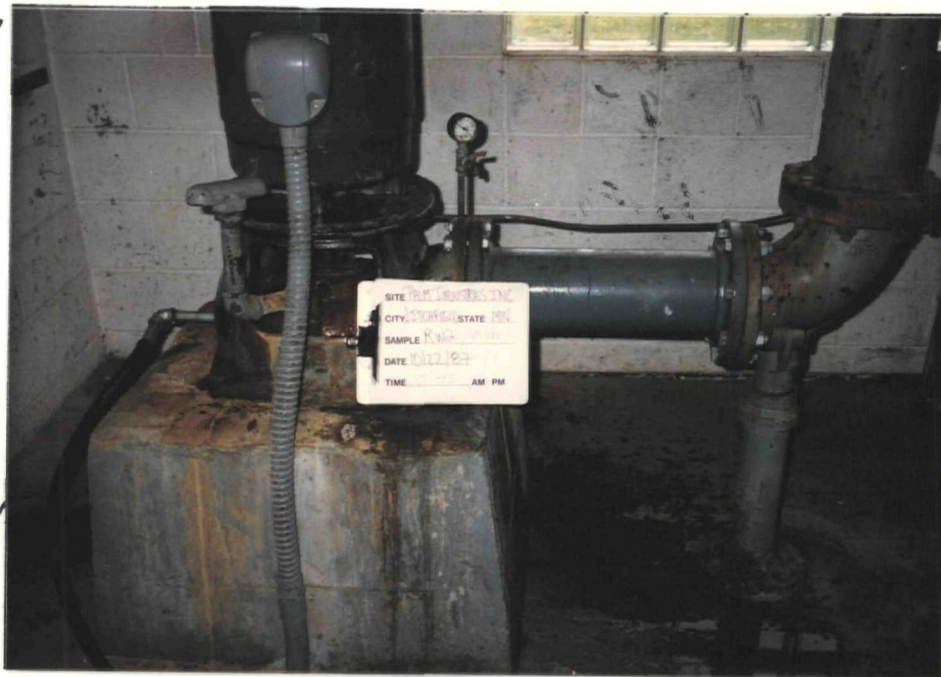
SITE NAME: PALM INDUSTRIES INC. PAGE 14 OF 17U.S. EPA ID: MND044176394 TDD: F05-8707-016 PAN: FMN 01165ADATE: > 10/22/87TIME: > 10 45DIRECTION OF
PHOTOGRAPH:> WestWEATHER
CONDITIONS:> Clear> 45°

PHOTOGRAPHED BY:

> Matt Arnold

SAMPLE ID

(if applicable):

> RW 2/MSDDESCRIPTION: > Municipal well #8, close-up view,
> East 10th Street Litchfield.DATE: > 10/22/87TIME: > 10 45DIRECTION OF
PHOTOGRAPH:> WestWEATHER
CONDITIONS:> Clear> 45°

PHOTOGRAPHED BY:

> MATT Arnold

SAMPLE ID

(if applicable):

> RW 2/MSDDESCRIPTION: > Municipal well #8, panoramic view
> East 10th Street Litchfield.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: PALM INDUSTRIES INC. PAGE 15 OF 17U.S. EPA ID: MND044176394 TDD: F05-8707-016 PAN: FMN 01165ADATE: > 10/22/87TIME: > 1145DIRECTION OF
PHOTOGRAPH:
> EastWEATHER
CONDITIONS:
> Clear> 45°PHOTOGRAPHED BY
> Matt ArSAMPLE ID
(if applicable)
> RW 3DESCRIPTION: >
> RT, 3,DATE: > 10/22TIME: > 114DIRECTION OF
PHOTOGRAPH:
> NorthWEATHER
CONDITIONS:
> Clear> 45°PHOTOGRAPHED BY
> MATT ASAMPLE ID
(if applicable)
> RW 3DESCRIPTION: >
> RT, 3

ew

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: PALM INDUSTRIES INC. PAGE 16 OF 17U.S. EPA ID: MA10044176394 TDD: EO5-8707-016 PAN: EMAL01165ADATE: > 10/2TIME: > 12DIRECTION OF
PHOTOGRAPH:> EastWEATHER
CONDITIONS:> Clear> 45°

PHOTOGRAPHER

> Matt A.SAMPLE ID
(if applicab> RW4

DESCRIPTION:

> WestDATE: > 10/2TIME: > 12DIRECTION OF
PHOTOGRAPH:> SouthWEATHER
CONDITIONS:> Clear> 45°

PHOTOGRAPHER

> MATTSAMPLE ID
(if applica> RW4

DESCRIPTION

> West

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: PALM INDUSTRIES INC. PAGE 17 OF 17U.S. EPA ID: MND044176394 TDD: F05-8707-016 PAN: FMN 01165ADATE: > 10/22/87TIME: > 10 30DIRECTION OF
PHOTOGRAPH:> EastWEATHER
CONDITIONS:> Clear> 45°

PHOTOGRAPHED BY:

> Matt ArnoldSAMPLE ID
(if applicable):> RWS DupDESCRIPTION: > Municipal well #14,> North Miller Road, Litchfield.DATE: > 10/22/87TIME: > 10 30DIRECTION OF
PHOTOGRAPH:> EastWEATHER
CONDITIONS:> Clear> 45°

PHOTOGRAPHED BY:

> MATT ArnoldSAMPLE ID
(if applicable):> RWS DupDESCRIPTION: > Municipal well #14, panoramic view,> North Miller Road, Litchfield.

APPENDIX D

U.S. EPA TARGET COMPOUND LIST
AND TARGET ANALYTE LIST
QUANTITATION/DETECTION LIMITS

TABLE A
CONTRACT LABORATORY PROGRAM
HAZARDOUS SUBSTANCE LIST (HSL)
VOLATILES DETECTION LIMITS

COMPOUND	CAS #	WATER	SOIL SEDIMENT SLUDGE
Chloromethane	74-87-3	10 ug/L	10 ug/KG
Bromomethane	74-83-9	10	10
Vinyl Chloride	75-01-4	10	10
Chloroethane	75-00-3	10	10
Methylene Chloride	75-09-2	5	5
Acetone	67-64-1	10	10
Carbon Disulfide	75-15-0	5	5
1,1-Dichloroethene	75-35-4	5	5
1,1-Dichloroethane	75-35-3	5	5
trans-1,2-Dichloroethene	156-60-5	5	5
Chloroform	67-66-3	5	5
1-2-Dichloroethane	107-06-2	5	5
2-Butanone (MEK)	78-93-3	10	10
1,1,1-Trichloroethane	71-55-6	5	5
Carbon Tetrachloride	56-23-5	5	5
Vinyl Acetate	108-05-4	10	10
Bromodichloromethane	75-27-4	5	5
1,1,2,2-Tetrachloroethane	79-34-5	5	5
1,2-Dichloropropane	78-87-5	5	5
trans-1,3-Dichloropropene	10061-02-6	5	5
Trichloroethene	79-01-6	5	5
Dibromochloromethane	124-48-1	5	5
1,1,2-Trichloroethane	79-00-5	5	5
Benzene	71-43-2	5	5
cis-1,3-Dichloropropene	10061-01-5	5	5
2-Chloroethyl Vinyl Ether	110-75-8	10	10
Bromoform	75-25-2	5	5
2-Hexanone	591-78-6	10	10
4-Methyl-2-pentanone	108-10-1	10	10
Tetrachloroethene	127-18-4	5	5
Toluene	108-88-3	5	5
Chlorobenzene	108-90-7	5	5
Ethyl Benzene	100-41-4	5	5
Styrene	100-42-5	5	5
Total Xylenes		5	5

TABLE A (Cont.)
 CONTRACT LABORATORY PROGRAM
 HAZARDOUS SUBSTANCE LIST (HSL)
 SEMI-VOLATILES DETECTION LIMITS

COMPOUND	CAS #	WATER	SOIL SEDIMENT SLUDGE
N-Nitrosodimethylamine	62-75-9	10 ug/L	330 ug/KG
Phenol	108-95-2	10	330
Aniline	62-53-3	10	330
bis(2-Chloroethyl) ether	111-44-4	10	330
2-Chlorophenol	95-57-8	10	330
1,3-Dichlorobenzene	541-73-1	10	330
1,4-Dichlorobenzene	106-46-7	10	330
Benzyl Alcohol	100-51-6	10	330
1,2-Dichlorobenzene	95-50-1	10	330
2-Methylphenol	95-48-7	10	330
bis(2-Chloroisopropyl) ether	39638-32-9	10	330
4-Methylphenol	106-44-5	10	330
N-Nitroso-Di-n-propylamine	621-64-7	10	330
Hexachloroethane	67-72-1	10	330
Nitrobenzene	98-95-3	10	330
Isophorone	78-59-1	10	330
2-Nitrophenol	88-75-5	10	330
2,4-Dimethylphenol	105-67-9	10	330
Benzoic Acid	65-85-0	50	1600
bis-(2-Chloroethoxy) methane	111-91-1	10	330
2,4-Dichlorophenol	120-83-2	10	330
1,2,4-Trichlorobenzene	120-82-1	10	330
Naphthalene	91-20-3	10	330
4-Chloroaniline	106-47-8	10	330
Hexachlorobutadiene	87-68-3	10	300
4-Chloro-3-methylphenol	59-50-7	10	330
2-Methylnaphthalene	91-57-6	10	330
Hexachlorocyclopentadiene	77-47-4	10	330
2,4,6-Trichlorophenol	88-06-2	10	330
2,4,5-Trichlorophenol	95-95-4	50	1600
2-Chloronaphthalene	91-58-7	10	330
2-Nitroaniline	88-74-4	50	1600
Dimethyl Phthalate	131-11-3	10	330
Acenaphthylene	208-96-8	10	330
3-Nitroaniline	99-09-2	50	1600
Acenaphthene	83-32-9	10	330
2,4-Dinitrophenol	51-28-5	50	1600
4-Nitrophenol	100-02-7	50	1600
Dibenzofuran	132-64-9	10	330
2,4-Dinitrotoluene	121-14-2	10	330
2,6-Dinitrotoluene	606-20-2	10	330
Diethylphthalate	84-66-2	10	330
4-Chlorophenyl phenylether	7005-72-3	10	330

Cont.

TABLE A (Cont.)
 CONTRACT LABORATORY PROGRAM
 HAZARDOUS SUBSTANCE LIST (HSL)
 SEMI-VOLATILES DETECTION LIMITS

COMPOUND	CAS #	WATER	SOIL SLUDGE SEDIMENT
Fluorene	86-73-7	10 ug/L	330 ug/KG
4-Nitroaniline	100-01-6	50	1600
4,6-Dinitro-2-methylphenol	534-52-1	50	1600
N-nitrosodiphenylamine	86-30-6	10	330
4-Bromophenyl phenyl ether	101-55-3	10	330
Hexachlorobenzene	118-74-1	10	330
Pentachlorophenol	87-86-5	50	1600
Phenanthrene	85-01-8	10	330
Anthracene	120-12-7	10	330
Di-n-butyl phthalate	84-74-2	10	330
Fluoranthene	206-44-0	10	330
Benzidine	92-87-5	80	2600
Pyrene	129-00-0	10	330
Butylbenzyl phthalate	85-68-7	10	330
3,3'-Dichlorobenzidine	91-94-7	10	660
Benzo(a)anthracene	56-55-3	10	330
bis(2-ethylhexyl)phthalate	117-81-7	10	330
Chrysene	218-01-9	10	330
Di-n-octyl phthalate	117-84-0	10	330
Benzo(b)fluoranthene	205-99-2	10	330
Benzo(k)fluoranthene	207-08-9	10	330
Benzo(a)pyrene	50-32-8	10	330
Indeno(1,2,3-cd)pyrene	193-39-5	10	330
Dibenz(a,h)anthracene	53-70-3	10	330
Benzo(g,h,i)perylene	191-24-2	10	330

TABLE A (Cont.)
 CONTRACT LABORATORY PROGRAM
 HAZARDOUS SUBSTANCE LIST (HSL)
 PESTICIDE AND PCB DETECTION LIMITS

COMPOUND	CAS #	WATER	SOIL SEDIMENT SLUDGE	
			ug/L	ug/KG
alpha-BHC	319-84-6	0.05	8	8
beta-BHC	319-85-7	0.05	8	8
delta-BHC	319-86-8	0.05	8	8
gamma-BHC (Lindane)	58-89-9	0.05	8	8
Heptachlor	76-44-8	0.05	8	8
Aldrin	309-00-2	0.05	8	8
Heptachlor Epoxide	1024-57-3	0.05	8	8
Edosulfan I	959-98-8	0.05	8	8
Dieldrin	60-57-1	0.10	16	16
4,4'-DDE	72-55-9	0.10	16	16
Endrin	72-20-8	0.10	16	16
Edosulfan II	33213-65-9	0.10	16	16
4,4'-DDD	72-54-8	0.10	16	16
Endrin Aldehyde	7421-93-4	0.10	16	16
Endosulfan Sulfate	1031-07-8	0.10	16	16
4,4'-DDT	50-29-3	0.10	16	16
Endrin Ketone	53494-70-5	0.10	16	16
Methoxychlor (Mariate)	72-43-5	0.5	80	80
Chlordane	57-74-9	0.5	80	80
Toxaphene	8001-35-2	1.0	160	160
AROCLOR-1016	12674-11-2	0.5	80	80
AROCLOR-1221	11104-28-2	0.5	80	80
AROCLOR-1232	11141-16-5	0.5	80	80
AROCLOR-1242	53469-21-9	0.5	80	80
AROCLOR-1248	12672-29-6	0.5	80	80
AROCLOR-1254	11097-69-1	1.0	160	160
AROCLOR-1260	11096-82-5	1.0	160	160

TABLE A (Cont.)
 CONTRACT LABORATORY PROGRAM
 HAZARDOUS SUBSTANCE LIST (HSL)
 INORGANIC DETECTION LIMITS

COMPOUND	PROCEDURE	DETECTION LIMITS	
		WATER	SOIL SEDIMENT SLUDGE
ALUMINUM	ICP	200 ug/L	40 mg/KG
ANTIMONY	FURNACE	60	2.4
ARSENIC	FURNACE	10	2
BARIUM	ICP	200	40
BERYLLIUM	ICP	5	1
CADMIUM	ICP	5	1
CALCIUM	ICP	5000	1000
CHROMIUM	ICP	10	2
COBALT	ICP	50	10
COPPER	ICP	25	5
IRON	ICP	100	20
LEAD	FURNACE	5	1
MAGNESIUM	ICP	5000	1000
MANGANESE	ICP	15	3
MERCURY	COLD VAPOR	0.2	0.008
NICKEL	ICP	40	8
POTASSIUM	ICP	5000	1000
SELENIUM	FURNACE	5	1
SILVER	ICP	10	2
SODIUM	ICP	5000	1000
THALLIUM	FURNACE	10	2
TIN	ICP	40	8
VANADIUM	ICP	50	10
ZINC	ICP	20	4
CYANIDE	COLOR	10	2

TABLE B
CENTRAL REGIONAL LABORATORY
VOLATILES DETECTION LIMITS

PARAMETER	CAS #	DETECTION LIMIT IN REAGENT WATER
BENZENE	71-43-2	1.5 ug/L
BROMODICHLOROMETHANE	75-27-4	1.5
BROMOFORM	75-25-2	1.5
BROMOMETHANE	74-83-9	10
CARBON TETRACHLORIDE	56-23-5	1.5
CHLOROBENZENE	108-90-7	1.5
CHLOROETHANE	75-00-3	1.5
2-CHLOROETHYL VINYL ETHER	110-75-8	1.5
CHLOROFORM	67-66-3	1.5
CHLOROMETHANE	74-87-3	10
DIBROMOCHLOROMETHANE	124-48-1	1.5
1,1-DICHLOROETHANE	75-34-3	1.5
1,2-DICHLOROETHANE	107-06-2	1.5
1,1-DICHLOROETHENE	75-35-4	1.5
trans-1,2-DICHLOROETHENE	156-60-5	1.5
1,2-DICHLOROPROPANE	78-87-5	1.5
cis-1,3-DICHLOROPROPENE	10061-01-5	2
trans-1,3-DICHLOROPROPENE	10061-02-6	1
ETHYL BENZENE	100-41-4	1.5
METHYLENE CHLORIDE *	75-09-2	1
1,1,2,2-TETRACHLOROETHANE	79-34-5	1.5
TETRACHLOROETHENE	127-18-4	1.5
TOLUENE *	108-88-3	1.5
1,1,1-TRICHLOROETHANE	71-55-6	1.5
1,1,2-TRICHLOROETHANE	79-00-5	1.5
TRICHLOROETHENE	79-01-6	1.5
VINYL CHLORIDE	75-01-4	10
ACROLEIN	107-02-8	100
ACETONE *	67-64-1	75
ACRYLONITRILE	107-13-1	50
CARBON DISULFIDE	75-15-0	3
2-BUTANONE	78-93-3	(50)
VINYL ACETATE	108-05-4	15
4-METHYL-2-PENTANONE	108-10-1	(3)
2-HEXANONE	519-78-6	(50)
STYRENE	100-42-5	1
m-XYLENE	108-38-3	2
o-XYLENE **	95-47-6	
p-XYLENE **	106-42-3	2.5 **

* Common Laboratory Solvents.

Blank Limit is 5x Method Detection Limit.

() Values in parentheses are estimates.

Actual values are being determined at this time

** The o-Xylene and p-xylene are reported as a total of the two.

TABLE B (Cont.)

CRL

SEMI-VOLATILES DETECTION LIMITS

PARAMETER	CAS #	DETECTION LIMIT	BLANK LIMIT
ANILINE	62-53-3	1.5 ug/L	3 ug/L
BIS (2-CHLOROETHYL) ETHER	111-44-4	1.5	3
PHENOL	108-95-2	2	4
2-CHLOROPHENOL	95-57-8	2	4
1,3-DICHLOROBENZENE	541-73-1	2	4
1,4-DICHLOROBENZENE	106-46-7	2	4
1,2-DICHLOROBENZENE	95-50-1	2.5	5
BENZYL ALCOHOL	100-51-6	2	4
BIS (2-CHLOROISOPROPYL) ETHER 39	638-32-9	2.5	5
2-METHYLPHENOL	95-48-7	1	2
HEXACHLOROETHANE	67-72-1	2	4
N-NITROSODIPROPYLAMINE	621-64-7	1.5	3
NITROBENZENE	98-95-3	2.5	5
4-METHYLPHENOL	106-44-5	1	2
ISOPHORONE	78-59-1	2.5	5
2-NITROPHENOL	88-75-5	2	4
2,4-DIMETHYLPHENOL	105-67-9	2	4
BIS (2-CHLOROETHOXY) METHANE	111-91-1	2.5	5
2,4-DICHLOROPHENOL	120-83-2	2	4
1,2,4-TRICHLOROBENZENE	120-82-1	2	4
NAPHTHALENE	91-20-3	2	4
4-CHLOROANILINE	106-47-8	2	4
HEXACHLOROBUTADIENE	87-68-3	2.5	5
BENZOIC ACID	65-85-0	(30)	(60)
2-METHYLNAPHTHALENE	91-57-6	2	4
4-CHLORO-3-METHYLPHENOL	59-50-7	1.5	3
HEXACHLOROCYCLOPENTADIENE	77-47-4	2	4
2,4,6-TRICHLOROPHENOL	88-06-2	1.5	3
2,4,5-TRICHLOROPHENOL	95-95-4	1.5	3
2-CHLORONAPHTHALENE	91-58-7	1.5	3
ACENAPHTHYLENE	208-96-8	1.5	3
DIMETHYL PHTHALATE	131-11-3	1.5	3
2,6-DINITROTOLUENE	606-20-2	1	2
ACENAPHTHENE	83-32-9	1.5	3
3-NITROANILINE	99-09-2	2.5	5
DIBENZOFURAN	132-64-9	1	2
2,4-DINITROPHENOL	51-28-5	(15)	(30)
2,4-DINITROTOLUENE	121-14-2	1	2

Cont.

TABLE B (Cont.)

CRL

SEMI-VOLATILE DETECTION LIMITS

PARAMETER	CAS #	DETECTION LIMIT	BLANK LIMIT
FLUORENE	86-73-7	1 ug/L	2 ug/L
4-NITROPHENOL	100-02-7	1.5	3
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	1	2
DIETHYL PHTHALATE	84-66-2	1	2
4,6-DINITRO-2-METHYLPHENOL	534-52-1	(15)	(30)
1,2-DIPHENYLHYDRAZINE	122-66-7	1	2
N-NITROSODIPHENYLAMINE *	86-30-6		
DIPHENYLAMINE *	122-39-4	1.5	3
4-NITROANILINE	100-01-6	3	6
4-BROMOPHENYL PHENYL ETHER	101-55-3	1.5	3
HEXACHLOROBENZENE	118-74-1	1.5	3
PENTACHLOROPHENOL	87-86-5	2	4
PHENANTHRENE	85-01-8	1	2
ANTHRACENE	120-12-7	2.5	5
DI-n-BUTYL PHTHALATE	84-74-2	2	4
FLUORANTHENE	206-44-0	1.5	3
PYRENE	129-00-0	1.5	3
BUTYL BENZYL PHTHALATE	85-68-7	3.5	7
CHRYSENE **	218-01-9		
BENZO (a) ANTHRACENE **	56-55-3	1.5	3
BIS (2-ETHYLHEXYL) PHTHALATE	117-81-7	1	2
DI-n-OCTYL PHTHALATE	117-84-0	1.5	3
BENZO (b) FLUORANTHENE ***	205-99-2		
BENZO (k) FLUORANTHENE ***	207-08-9	1.5	3
BENZO (a) PYRENE	50-32-8	2	4
INDENO (1,2,3-cd) PYRENE	193-39-5	3.5	7
DIBENZO (a,h) ANTHRACENE	53-70-3	2.5	5
BENZO (g,h,i) PERYLENE	191-24-2	4	8
2-NITROANILINE	88-74-4	1	2

* These two parameters are reported as a total.

** These two parameters are reported as a total.

*** These two parameters are reported as a total.

() Values in Parentheses are estimates of the values are being determined at this time.

NOTE: Limits are for reagent water.

TABLE B (Cont.)
CRL
PESTICIDE AND PCB DETECTION LIMITS

PARAMETER	CAS #	DETECTION LIMIT	
ALDRIN	309-00-2	0.005	ug/L
alpha BHC	319-84-6	(0.010)	
beta BHC	319-85-7	(0.005)	
delta BHC	319-86-8	(0.005)	
gamma BHC (LINDANE)	58-89-9	0.005	
CHLORDANE	57-74-9	(0.020)	
4,4'-DDD	72-54-8	(0.020)	
4,4'-DDE	72-55-9	(0.005)	
4,4'-DDT	50-29-3	0.020	
DIELDRIN	60-57-1	0.010	
ENDOSULFAN I	959-98-8	0.010	
ENDOSULFAN II	33213-65-9	0.010	
ENDOSULFAN SULFATE	1031-07-8	(0.10)	
ENDRIN	72-20-8	0.010	
ENDRIN ALDEHYDE	7421-93-4	(0.030)	
ENDRIN KETONE	53494-70-5	(0.030)	
HEPTACHLOR	76-44-8	0.030	
HEPTACHLOR EPOXIDE	1024-57-3	0.005	
4,4'-METHOXYCHLOR	72-43-5	0.020	
TOXAPHENE	8001-35-2	(0.25)	
PCB-1242	53469-21-9	(0.10)	
PCB-1248	12672-29-6	(0.10)	
PCB-1254	11097-69-1	(0.10)	
PCB-1260	11096-82-5	(0.10)	

() Values in parentheses are estimates.
Actual values are being determined at this time.

NOTE: Limits are for reagent water.

TABLE B (Cont.)
CRL
INORGANIC DETECTION LIMITS

JANUARY 1986

COMPOUND	PROCEDURE	DETECTION LIMITS	RANGE	UNITS
ALUMINUM	ICP	80	80 TO 1,000,000	ug/L
ANTIMONY	FURNACE	2	2 TO 30	ug/L
ARSENIC	FURNACE	2	2 TO 30	ug/L
BARIUM	ICP	6	6 TO 20,000	ug/L
BERYLLIUM	ICP	1	1 TO 20,000	ug/L
BORON	ICP	80	80 TO 20,000	ug/L
CADMIUM	ICP	10	10 TO 20,000	ug/L
CADMIUM	FURNACE	0.2	0.2 TO 2	ug/L
CALCIUM	ICP	0.5	0.5 TO 1,000	mg/L
CHROMIUM	ICP	8	8 TO 20,000	ug/L
COBALT	ICP	6	6 TO 20,000	ug/L
COPPER	ICP	6	6 TO 20,000	ug/L
IRON	ICP	80	80 TO 1,000,000	ug/L
LEAD	FURNACE	2	2 TO 30	ug/L
LEAD	ICP	70	70 TO 20,000	ug/L
LITHIUM	ICP	10	10 TO 20,000	ug/L
MAGNESIUM	ICP	0.1	0.1 TO 200	mg/L
MANGANESE	ICP	5	5 TO 20,000	ug/L
MERCURY	COLD VAPOR	0.1	0.1 TO 2	ug/L
MOLYBDENUM	ICP	15	15 TO 20,000	ug/L
NICKEL	ICP	15	15 TO 20,000	ug/L
POTASSIUM	ICP	2	2 TO 1,000	mg/L
SELENIUM	FURNACE	2	2 TO 30	ug/L
SILVER	ICP	6	6 TO 10,000	ug/L
SODIUM	ICP	1	1 TO 1000	mg/L
STRONTIUM	ICP	10	10 TO 20,000	ug/L
SULFIDE	TITRATION	1	< 1	mg/L
SULFIDE	COLOR	0.05	< 1	mg/L
THALLIUM	FURNACE	2	2 TO 30	ug/L
TITANIUM	ICP	25	25 TO 20,000	ug/L
TIN	ICP	40	40 TO 20,000	ug/L
VANADIUM	ICP	5	5 TO 20,000	ug/L
YTTRIUM	ICP	5	5 TO 20,000	ug/L
ZINC	ICP	40	40 TO 1,000,000	ug/L
CYANIDE	AA	8	8 TO 200	ug/L

NOTE: THE ABOVE LIST MAY OR MAY NOT CONTAIN COMPOUNDS THAT ARE ROUTINELY ANALYZED AT CRL FOR LOW LEVEL DETECTION LIMITS FOR DRINKING WATER.

TABLE C
SPECIAL ANALYTICAL SERVICES DRINKING WATER
VOLATILE DETECTION LIMITS

PARAMETER	CAS #	DETECTION LIMIT IN REAGENT WATER
BENZENE	71-43-2	1.5 ug/L
BROMODICHLOROMETHANE	75-27-4	1.5
BROMOFORM	75-25-2	1.5
BROMOMETHANE	74-83-9	10
CARBON TETRACHLORIDE	56-23-5	1.5
CHLOROBENZENE	108-90-7	1.5
CHLOROETHANE	75-00-3	1.5
2-CHLOROETHYL VINYL ETHER	110-75-8	1.5
CHLOROFORM	67-66-3	1.5
CHLOROMETHANE	74-87-3	10
DIBROMOCHLOROMETHANE	124-48-1	1.5
1,1-DICHLOROETHANE	75-34-3	1.5
1,2-DICHLOROETHANE	107-06-2	1.5
1,1-DICHLOROETHENE	75-35-4	1.5
trans-1,2-DICHLOROETHENE	156-60-5	1.5
1,2-DICHLOROPROPANE	78-87-5	1.5
cis-1,3-DICHLOROPROPENE	10061-01-5	2
trans-1,3-DICHLOROPROPENE	10061-02-6	1
ETHYL BENZENE	100-41-4	1.5
METHYLENE CHLORIDE *	75-09-2	1
1,1,2,2-TETRACHLOROETHANE	79-34-5	1.5
TETRACHLOROETHENE	127-18-4	1.5
TOLUENE *	108-88-3	1.5
1,1,1-TRICHLOROETHANE	71-55-6	1.5
1,1,2-TRICHLOROETHANE	79-00-5	1.5
TRICHLOROETHENE	79-01-6	1.5
VINYL CHLORIDE	75-01-4	10
ACROLEIN	107-02-8	100
ACETONE *	67-64-1	75
ACRYLONITRILE	107-13-1	50
CARBON DISULFIDE	75-15-0	3
2-BUTANONE	78-93-3	(50)
VINYL ACETATE	108-05-4	15
4-METHYL-2-PENTANONE	108-10-1	(3)
2-HEXANONE	519-78-6	(50)
STYRENE	100-42-5	1
m-XYLENE	108-38-3	2
o-XYLENE **	95-47-6	
p-XYLENE **	106-42-3	2.5 **

* Common Laboratory Solvents.

Blank Limit is 5x Method Detection Limit.

() Values in parentheses are estimates.

Actual values are being determined at this time

** The o-Xylene and p-xylene are reported as a total of the two.

TABLE C (Cont.)
SAS DRINKING WATER
SEMI-VOLATILES DETECTION LIMITS

PARAMETER	CAS #	DETECTION LIMIT	BLANK LIMIT
ANILINE	62-53-3	1.5 ug/L	3 ug/L
BIS (2-CHLOROETHYL) ETHER	111-44-4	1.5	3
PHENOL	108-95-2	2	4
2-CHLOROPHENOL	95-57-8	2	4
1,3-DICHLOROBENZENE	541-73-1	2	4
1,4-DICHLOROBENZENE	106-46-7	2	4
1,2-DICHLOROBENZENE	95-50-1	2.5	5
BENZYL ALCOHOL	100-51-6	2	4
BIS (2-CHLOROISOPROPYL) ETHER	39638-32-9	2.5	5
2-METHYLPHENOL	95-48-7	1	2
HEXACHLOROETHANE	67-72-1	2	4
N-NITROSODIPROPYLAMINE	621-64-7	1.5	3
NITROBENZENE	98-95-3	2.5	5
4-METHYLPHENOL	106-44-5	1	2
ISOPHORONE	78-59-1	2.5	5
2-NITROPHENOL	88-75-5	2	4
2,4-DIMETHYLPHENOL	105-67-9	2	4
BIS (2-CHLOROETHOXY) METHANE	111-91-1	2.5	5
2,4-DICHLOROPHENOL	120-83-2	2	4
1,2,4-TRICHLOROBENZENE	120-82-1	2	4
NAPHTHALENE	91-20-3	2	4
4-CHLOROANILINE	106-47-8	2	4
HEXACHLOROBUTADIENE	87-68-3	2.5	5
BENZOIC ACID	65-85-0	(30)	(60)
2-METHYLNAPHTHALENE	91-57-6	2	4
4-CHLORO-3-METHYLPHENOL	59-50-7	1.5	3
HEXACHLOROCYCLOPENTADIENE	77-47-4	2	4
2,4,6-TRICHLOROPHENOL	88-06-2	1.5	3
2,4,5-TRICHLOROPHENOL	95-95-4	1.5	3
2-CHLORONAPHTHALENE	91-58-7	1.5	3
ACENAPHTHYLENE	208-96-8	1.5	3
DIMETHYL PHTHALATE	131-11-3	1.5	3
2,6-DINITROTOLUENE	606-20-2	1	2
ACENAPHTHENE	83-32-9	1.5	3
3-NITROANILINE	99-09-2	2.5	5
DIBENZOFURAN	132-64-9	1	2
2,4-DINITROPHENOL	51-28-5	(15)	(30)
2,4-DINITROTOLUENE	121-14-2	1	2

Cont.

TABLE C (Cont.)
SAS DRINKING WATER
SEMI-VOLATILE DETECTION LIMITS

PARAMETER	CAS #	DETECTION LIMIT	BLANK LIMIT
FLUORENE	86-73-7	1 ug/L	2 ug/L
4-NITROPHENOL	100-02-7	1.5	3
4-CHLOROPHENYL PHENYL ETHER	7005-72-3	1	2
DIETHYL PHTHALATE	84-66-2	1	2
4,6-DINITRO-2-METHYLPHENOL	534-52-1	(15)	(30)
1,2-DIPHENYLHYDRAZINE	122-66-7	1	2
N-NITROSODIPHENYLAMINE *	86-30-6		
DIPHENYLAMINE *	122-39-4	1.5	3
4-NITROANILINE	100-01-6	3	6
4-BROMOPHENYL PHENYL ETHER	101-55-3	1.5	3
HEXACHLOROBENZENE	118-74-1	1.5	3
PENTACHLOROPHENOL	87-86-5	2	4
PHENANTHRENE	85-01-8	1	2
ANTHRACENE	120-12-7	2.5	5
DI-n-BUTYL PHTHALATE	84-74-2	2	4
FLUORANTHENE	206-44-0	1.5	3
PYRENE	129-00-0	1.5	3
BUTYL BENZYL PHTHALATE	85-68-7	3.5	7
CHRYSENE **	218-01-9		
BENZO(a)ANTHRACENE **	56-55-3	1.5	3
BIS(2-ETHYLHEXYL) PHTHALATE	117-81-7	1	2
DI-n-OCTYL PHTHALATE	117-84-0	1.5	3
BENZO(b)FLUORANTHENE ***	205-99-2		
BENZO(k)FLUORANTHENE ***	207-08-9	1.5	3
BENZO(a)PYRENE	50-32-8	2	4
INDENO(1,2,3-cd)PYRENE	193-39-5	3.5	7
DIBENZO(a,h)ANTHRACENE	53-70-3	2.5	5
BENZO(g,h,i)PERYLENE	191-24-2	4	8
2-NITROANILINE	88-74-4	1	2

* These two parameters are reported as a total.

** These two parameters are reported as a total.

*** These two parameters are reported as a total.

() Values in Parentheses are estimates of the values are being
The actual values are being determined at this time.

NOTE: Limits are for reagent water.

TABLE C (Cont.)
SAS DRINKING WATER
PESTICIDE AND PCB DETECTION LIMITS

PARAMETER	CAS #	DETECTION LIMIT
ALDRIN	309-00-2	0.005 ug/L
alpha BHC	319-84-6	(0.010)
beta BHC	319-85-7	(0.005)
delta BHC	319-86-8	(0.005)
gama BHC (LINDANE)	58-89-9	0.005
CHLORDANE	57-74-9	(0.020)
4,4'-DDD	72-54-8	(0.020)
4,4'-DDE	72-55-9	(0.005)
4,4'-DDT	50-29-3	0.020
DIELDRIN	60-57-1	0.010
ENDOSULFAN I	959-98-8	0.010
ENDOSULFAN II	33213-65-9	0.010
ENDOSULFAN SULFATE	1031-07-8	(0.10)
ENDRIN	72-20-8	0.010
ENDRIN ALDEHYDE	7421-93-4	(0.030)
ENDRIN KETONE	53494-70-5	(0.030)
HEPTACHLOR	76-44-8	0.030
HEPTACHLOR EPOXIDE	1024-57-3	0.005
4,4'-METHOXYCHLOR	72-43-5	0.020
TOXAPHENE	8001-35-2	(0.25)
PCB-1242	53469-21-9	(0.10)
PCB-1248	12672-29-6	(0.10)
PCB-1254	11097-69-1	(0.10)
PCB-1260	11096-82-5	(0.10)

() Values in parentheses are estimates.
Actual values are being determined at this time.

NOTE: Limits are for reagent water.

TABLE C (Cont.)
SAS DRINKING WATER
INORGANIC DETECTION LIMITS

JANUARY 1986

PARAMETER	PROCEDURE	DETECTION LIMITS	RANGE	UNITS
ALUMINUM	ICP	80	80 TO 1,000,000	ug/L
ANTIMONY	FURNACE	2	2 TO 30	ug/L
ARSENIC	FURNACE	2	2 TO 30	ug/L
BARIUM	ICP	6	6 TO 20,000	ug/L
BERYLLIUM	ICP	1	1 TO 20,000	ug/L
CADMIUM	ICP	10	10 TO 20,000	ug/L
CADMIUM	FURNACE	0.2	0.2 TO 2	ug/L
CALCIUM	ICP	0.5	0.5 TO 1,000	mg/L
CHROMIUM	ICP	8	8 TO 20,000	ug/L
COBALT	ICP	6	6 TO 20,000	ug/L
COPPER	ICP	6	6 TO 20,000	ug/L
IRON	ICP	80	80 TO 1,000,000	ug/L
LEAD	FURNACE	2	2 TO 30	ug/L
LEAD	ICP	70	70 TO 20,000	ug/L
LITHIUM	ICP	10	10 TO 20,000	ug/L
MAGNESIUM	ICP	0.1	0.1 TO 200	mg/L
MANGANESE	ICP	5	5 TO 20,000	ug/L
MERCURY	COLD VAPOR	0.1	0.1 TO 2	ug/L
MOLYBDENUM	ICP	150	15 TO 20,000	ug/L
NICKEL	ICP	15	15 TO 20,000	ug/L
POTASSIUM	ICP	2	2 TO 1,000	mg/L
SELENIUM	FURNACE	2	2 TO 30	ug/L
SILVER	ICP	6	6 TO 10,000	ug/L
SODIUM	ICP	1	1 TO 30	mg/L
STRONTIUM	ICP	10	10 TO 20,000	ug/L
THALLIUM	FURNACE	2	2 TO 30	ug/L
TITANIUM	ICP	25	25 TO 20,000	ug/L
TIN	ICP	40	40 TO 20,000	ug/L
VANADIUM	ICP	5	5 TO 20,000	ug/L
YTTRIUM	ICP	5	5 TO 20,000	ug/L
ZINC	ICP	40	40 TO 1,000,000	ug/L
CYANIDE	AA	8	8 TO 200	ug/L

NOTE: THE ABOVE LIST MAY OR MAY NOT CONTAIN COMPOUNDS
THAT ARE ROUTINELY ANALYZED AT CRL FOR LOW LEVEL DETECTION
LIMITS FOR DRINKING WATER.

TABLE C (Cont.)
SAS DRINKING WATER
INORGANIC DETECTION LIMITS

JANUARY 1986

PARAMETER	PROCEDURE	DETECTION LIMITS	RANGE	UNITS
ALUMINUM	ICP	80	80 TO 1,000,000	ug/L
ANTIMONY	FURNACE	2	2 TO 30	ug/L
ARSENIC	FURNACE	2	2 TO 30	ug/L
BARIUM	ICP	6	6 TO 20,000	ug/L
BERYLLIUM	ICP	1	1 TO 20,000	ug/L
CADMIUM	ICP	10	10 TO 20,000	ug/L
CADMIUM	FURNACE	0.2	0.2 TO 2	ug/L
CALCIUM	ICP	0.5	0.5 TO 1,000	mg/L
CHROMIUM	ICP	8	8 TO 20,000	ug/L
COBALT	ICP	6	6 TO 20,000	ug/L
COPPER	ICP	6	6 TO 20,000	ug/L
IRON	ICP	80	80 TO 1,000,000	ug/L
LEAD	FURNACE	2	2 TO 30	ug/L
LEAD	ICP	70	70 TO 20,000	ug/L
LITHIUM	ICP	10	10 TO 20,000	ug/L
MAGNESIUM	ICP	0.1	0.1 TO 200	mg/L
MANGANESE	ICP	5	5 TO 20,000	ug/L
MERCURY	COLD VAPOR	0.1	0.1 TO 2	ug/L
MOLYBDENUM	ICP	150	15 TO 20,000	ug/L
NICKEL	ICP	15	15 TO 20,000	ug/L
POTASSIUM	ICP	2	2 TO 1,000	mg/L
SELENIUM	FURNACE	2	2 TO 30	ug/L
SILVER	ICP	6	6 TO 10,000	ug/L
SODIUM	ICP	1	1 TO 30	mg/L
STRONTIUM	ICP	10	10 TO 20,000	ug/L
THALLIUM	FURNACE	2	2 TO 30	ug/L
TITANIUM	ICP	25	25 TO 20,000	ug/L
TIN	ICP	40	40 TO 20,000	ug/L
VANADIUM	ICP	5	5 TO 20,000	ug/L
YTTRIUM	ICP	5	5 TO 20,000	ug/L
ZINC	ICP	40	40 TO 1,000,000	ug/L
CYANIDE	AA	8	8 TO 200	ug/L

NOTE: THE ABOVE LIST MAY OR MAY NOT CONTAIN COMPOUNDS
THAT ARE ROUTINELY ANALYZED AT CRL FOR LOW LEVEL DETECTION
LIMITS FOR DRINKING WATER.

APPENDIX E

WELL LOGS OF THE AREA OF THE SITE

1. PROPERTY OWNER'S NAME
Nothnagel Sales
Address West Highway 12
Litchfield, Mn. 55355

Sketch map of well location.

Address Number
Block & Number
Lot Number

[illegible]

4. WELL DEPTH (completed)	Date of Completion
135	9-1-78

1 <input type="checkbox"/> Cable test	4 <input type="checkbox"/> Reverse	7 <input type="checkbox"/> Drive	10 <input type="checkbox"/> Dog
2 <input checked="" type="checkbox"/> Hydraulic rail	5 <input type="checkbox"/> Air	8 <input type="checkbox"/> Guard	11 <input type="checkbox"/> _____
3 <input type="checkbox"/> Brake	6 <input type="checkbox"/> Load	9 <input type="checkbox"/> _____	

6. USE

1 <input type="checkbox"/> Nonresidential	4 <input type="checkbox"/> Public Supply	7 <input type="checkbox"/> Industry
2 <input type="checkbox"/> Irrigation	5 <input type="checkbox"/> Municipal	8 <input type="checkbox"/> Commercial
3 <input type="checkbox"/> Transit, Mass	6 <input type="checkbox"/> Air Conditioning	9 <input type="checkbox"/> Other

7. CASING		HEIGHT: Above/Below _____		HOLE DIAM.
<input checked="" type="checkbox"/> Mark	<input checked="" type="checkbox"/> Threaded			
<input type="checkbox"/> Casing	<input type="checkbox"/> Welded	Surface	6' below ft.	
<input type="checkbox"/>	<input type="checkbox"/>	Drive Sheet?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
<input checked="" type="checkbox"/>	In. to	131	ft.	Weight
	In. to		ft.	Weight
	In. to		ft.	Weight

A. SCREEN _____
 Make Johnson _____
 Type Stainless steel _____
 Slot/Groove 25 slot _____
 Set between 191 ft. and 195 ft. _____
 _____ ft. and _____ ft. _____
 Dr. open hole _____
 from _____ ft. to _____ ft. _____
 Length 40 _____
 FITTINGS: _____

9. STATIC WATER LEVEL

_____ ft. and _____ ft. **lead packer**

_____ ft. ☐ below ☐ above Date Measured **0-1-22**

10. PUMPING LEVEL (Below land surface) 5-10-70

56 ft. after 3 hrs. pumping 14 p.m.

11. WELL HEAD COMPLETION

1 ☒ Wireless adapter 2 ☐ Basement office 3 ☒ At least 12" above grade

12. Well grouted? ☐ Yes ☒ No Co. Yds. _____

☐ Nest Cement ☒ Bestmate ☐ _____

Depth: from _____ ft. to _____ ft.

13. Nearest sources of possible contamination

100 feet NW direction septic tank

Well disinfected upon completion? Yes ☐ No ☐

14. PUMP

Date installed 10-9-78

☐ Not installed

Manufacturer's Name Valley

Model Number S1208-NF3052 HP 1 Volts 220

Length of drop pipe 84 R. capacity 10 G.P.M.

Material of drop pipe galv. steel

Type: ☒ Non-hurricane ☐ L. R. Turbine ☐ Backup of piping

☒ Jet ☐ Centrifugal ☐

16. WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Boerner Hall Co. 47047
Litchfield, Nn.

Address _____

Signed Michael P Boerner Date 1-11-7

Michael P Boerner Date 1-11-7

1. LOCATION OF WELL

County Name

Hooker

WATER WELL RECORD

Minnesota State no. 1364.01-00

For Short Sample

I 148225

Township Name

Township Number

Range Number

Section No.

Fraction

Litchfield

31N

31W

3

SW

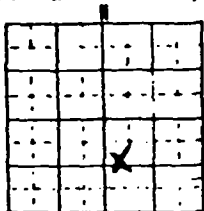
NW

SE

Distance and direction from base of section or from nearest section and city of well location

Show exact location of well on section grid with "X."

Sketch map of well location.



Addition Number

Block Number

Lot Number

2. FORMATION LOG

COLOR

HARDNESS OF FORMATION

FROM

TO

clay

yellow

soft

0

10

clay

blue

med

18

54

sand

brown

med

54

61

3. PROPERTY OWNER'S NAME

4. WELL DEPTH (completed)

Date of Completion

61

6-3-83

1. ☒ Able test☐ Reverse☐ Drive☐ Dig2. ☐ Handrow rod☐ Air☐ Bored☐ _____3. ☐ Rotary☐ Jetted☐ Power Auger

5. USE

1. ☐ Domestic☐ Public Supply☐ Industry2. ☐ Irrigation☐ Municipal☐ Commercial3. ☐ Test Well☐ Air Conditioning☒ Farm

6. CASING

HEIGHT: Above/Below

HOLE DIAM

1. ☒ Black☐ Galvanized

Surface _____ ft.

2. ☐ Galv☐ Welded

Drive Shaft? Yes _____ No _____

3. ☐ _____

4 in. to 57 ft. Weight 11 lbs./ft.

in. to _____ ft. Weight _____ lbs./ft.

in. to _____ ft. Weight _____ lbs./ft.

7. SCREEN

Make Johnson

Or specify hole

Type stainless steel

Dia. _____

Slot/Coe to 25

Length 4'

Set between 57 ft. and 61 ft.

K packer

8. STATIC WATER LEVEL

13

☒ Below land surface

Date Measured 6-3-83

9. PUMPING LEVEL (below land surface)

18

ft. after

3 hrs. pumping

15

s.g.m.

ft. after

hrs. pumping

s.g.m.

10. WELL HEAD COMPLETION

☐ Pile adapter☐ Basement offset☒ At least 12" above grade

11. Well grouted?

☐ Yes☒ No

Co. Yes _____

☐ Neat Cement☐ Bestimate☐ _____

Depth: from _____ ft. to _____ ft.

from _____ ft. to _____ ft.

12. Nearest source of possible contamination

55

ft.

NE

direction

barn

type

Well destructed upon completion?

Yes ☒ No ☐

13. PUMP

Date installed 6-27-83

☐ Not installed

Manufacturer's Name

Talb

Model Number

SST310

HP

1

Volts

220

Length of drop pipe

42'

ft. capacity

10

s.g.m.

Material of drop pipe

galv. steel

Type

☒ Submersible☐ L.S. Turbine☐ Reciprocating☐ Jet☐ Centrifugal☐ _____

14. WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Boerner Well Co

47047

License Business Name

License No.

Address Litchfield, Mn.

Signed

Michael Boerner

Date

8-30-83

Authorized Representative

Michael Boerner

Date 8-30-83

Name of Driller

RECEIVED

SEP 2 1983

Minn. Dept. of Health
GWOC

15. REMARKS, ELEVATION, SOURCE OF DATA, etc.

Use a second sheet, if needed.

Booker

Township Name	Township Number	Range Number	Section No.	Section
Litchfield	119 N E S	31 N E W	4	SE SE SW

Distance and Direction from Road Intersections or Street Address and City of Well Location

Distance and Direction from Road Intersections or Street Address and City of Well Location

Show exact location of well on section grid with "X."

Sketch map of well location.

A 4x4 grid of 16 squares. Each square contains a unique geometric pattern or shape, such as a triangle, a circle, a square, or a combination of these shapes. The patterns are arranged in a way that they can be used to teach geometry or pattern recognition.

E
T
4 ml
I

<p>Addition Points</p>
<p>Block & Numbering</p>
<p>Lot Number</p>

will.

2.	FORMATION LOG	COLOR	HARDNESS OF FORMATION	FROM	TO
----	---------------	-------	-----------------------	------	----

[illegible]

(Use a second sheet if needed)

15. SUMMARY OF DATA: **RECEIVED**

MAR 05 1982

~~Ill. Dept. of Health~~
~~Div. of Env. Health~~

MINN. GEOLOGICAL SURVEY COPY

185 8-7-'81

5. ☐ Cable land ☐ R. route ☐ Drains ☐ Dig

☒ Hollow rod ☐ Air ☐ Bored ☐ _____

☒ Rotary ☐ Jetted ☐ Power Auger

6. USE

☒ Domestic ☐ Public Supply ☐ Industry

☒ Irrigation ☐ Municipal ☐ Commercial

☒ Test Well ☐ Air Conditioning ☐ _____

7. CASING

☒ Smooth ☒ Threaded HEIGHT: Above/Below **6' below**

☒ Galv. ☐ Welded Surface _____ ft.

☐ _____ ☐ Drive Shoe? ☒ Yes ☒ No _____

4 in. to **181** ft. Weight **11** lbs./ft. _____ in. to _____ ft. _____ in. to _____ ft. _____ in. to _____ ft.

8. SCREEN

Make **Johnson** Or open hole _____ ft. to _____ ft.

Type **SS** Dia. **4"**

Slot/Coarse **25** Length **4'**

Set between **181** ft. and **185** ft. **K packer** SETTINGS:

_____ ft. and _____ ft.

9. STATIC WATER LEVEL

45 ft. below land surface ☒ above ☐ Date Measured **8-7-'81**

10. PUMPING LEVEL (below land surface)

_____ ft. after **3** hrs. pumping **60** g.p.m.

_____ ft. after _____ hrs. pumping _____ g.p.m.

11. WELL HEAD COMPLETION

☒ Plenum adapter ☐ Basement offset ☒ At least 12" above grade

12. Well grouted?

☒ Yes ☐ No Co. Yds. _____

☐ Neat Cement ☒ Groutcrete ☐ _____

Depth: from _____ ft. to _____ ft.

from _____ ft. to _____ ft.

13. Nearest source of possible contamination

75 feet **S E** direction **septic tank**

Well disinfected upon completion? Yes ☒ No ☐

14. PUMP

Date installed **8-12-'81**

☐ Not installed

Manufacturer's Name **Tait**

Model Number **5ST310** HP **1** Volts _____

Length of drop pipe **63** ft. capacity **10** g.p.m.

Material of drop pipe **galv. steel**

Type: ☒ Submersible ☐ L. S. Turbine ☐ Reciprocating

☐ Jet ☐ Centrifugal ☐ _____

16. WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Boerner Well Co. **47047**
 Licensee Business Name License No.

Address Litchfield, Mn. 55355

Signed W. E. B. DuBois Date 10/10/1900

Michael Boerner 3-4-'82

Name of Driller

5,74 3024